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PART 3

# NORTH AMERICAN FLORA

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(CHENOPODIALES)

ALLIONIACEAE

PAUL CARPENTER STANDLEY



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## ANNOUNCEMENT

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NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Myxomycetes, Schizophyta, Diatomaceae.

Volumes 2 to 10. Fungi.

Volumes 11 to 13. Algae.

Volumes 14 and 15. Bryophyta.

Volume 16. Pteridophyta and Gymnospermae.

Volumes 17 to 19. Monocotyledones.

Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Merrill, and Dr. J. H. Barnhart.

Professor George F. Atkinson, of Cornell University; Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; Professor Byron D. Halsted, of Rutgers College; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

THE NEW YORK BOTANICAL GARDEN

BRONX PARK

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### Family 3. ALLIONIACEAE\*

By PAUL CARPENTER STANDLEY

Herbs, shrubs, or trees, sometimes scandent, dichotomously or trichotomously branched, glabrous or pubescent, the stems often swollen at the nodes, sometimes armed with spines. Leaves simple, and opposite, alternate, or verticillate, estipulate, sessile or petiolate, the blades usually entire, sometimes toothed or lobed, raphidulous. Flowers perfect or unisexual, in the latter case usually dioecious, regular, sometimes dimorphous, usually arranged in paniculate or corymbose cymes, sometimes solitary, racemose, spicate, umbellulate, or capitate, usually bracteate or variously involucrate, the involucre of free or connate segments, often calyx-like and enclosing 1 or many flowers, persistent or deciduous, often accrescent in age, green or brightly colored. Perianth inferior, simple, herbaceous or corolla-like, small or large, usually campanulate or funnelform, persistent in fruit and usually accrescent, closely enclosing the pericarp; tube short or often much elongate, usually indurate at the base in age; limb persistent or deciduous, truncate or 3-5-dentate or lobed, the segments usually induplicate-valvate. Stamens 1-many, hypogynous; filaments usually united at the base, unequal, filiform; anthers included or exserted, dorsifixed near the base, didymous, the cells dehiscent by lateral slits. Ovary included in the perianth-tube, sessile or stipitate, 1-celled, membranaceous, usually attenuate at the apex; style short or elongate, sometimes wanting, filiform; stigma simple, and capitate, peltate, or fimbriate, rarely lateral or the style stigmatose along one side. Fruit an anthocarp, composed of the persistent, coriaceous, fleshy, or indurate base of the perianth-tube enclosing the indehiscent utricle and adherent to it, costate, sulcate, or alate, often viscous when wet, frequently bearing viscous glands; utricle membranaceous or coriaceous. Seed erect, the testa hyaline; endosperm scanty or abundant, usually farinaceous or fleshy; embryo straight, with broad conduplicate cotyledons, these enclosing the endosperm, or often curved and with broad or narrow cotyledons; radicle inferior.

Embryo straight; flowers usually unisexual; trees or shrubs, sometimes armed with spines; leaves all or partly opposite.

I. PISONIEAE.

Embryo curved; flowers perfect; plants usually herbaceous.

Leaves alternate.

Perianth unchanged in fruit, not differentiated into two parts; flowers racemose, free from the bracts; plants unarmed, and herbaceous, or suffrutescent at the base.

II. SALPIANTHEAE.

Perianth much changed in fruit, the lower part enlarged and adherent to the fruit, the upper part persistent; flowers borne in clusters of 3, each adnate to a large colored bract; spiny, scandent shrubs.

III. BOUGAINVILLEAE.

Leaves opposite.

Perianth-lobes valvate.

IV. COLIGNONIEAE.

Perianth-lobes induplicate-valvate.

Stigma spheric or hemispheric; both cotyledons well developed; anthocarp often with mucilaginous glands.

V. MIRABILEAE.

Stigma linear; inner cotyledon abortive; anthocarp without mucilaginous glands; flowers capitate.

VI. ABRONIEAE.

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## I. PISONIEAE

Stamens included; anthocarp without stipitate glands.

Stamens 5-10; limb of the staminate perianth little or not at all broader than the tube.

Stamens 25-30; limb of the staminate perianth much broader than the tube.

Stamens exserted.

Anthocarp fleshy, without glands; flowers cymose, unisexual; stems unarmed.

Anthocarp coriaceous, bearing numerous stipitate glands.

Flowers unisexual, cymose; stigma penicillate; stems often armed with spines.

Flowers perfect, umbellate; stigma depressed-capitate; stems unarmed.

1. NEEA.

2. CEPHALOTOMANDRA.

3. TORRUBIA.

4. PISONIA.

5. PISONIELLA.

## II. SALPIANTHEAE

A single genus in North America.

6. SALPIANTHUS.

## III. BOUGAINVILLEAE

A single genus.

7. BOUGAINVILLEA.

## IV. COLIGNONIEAE

A single genus in North America.

8. COLIGNONIA.

## V. MIRABILEAE

Flowers borne each upon the costa of a broad foliaceous bract.

Flowers variously arranged but never borne upon the costa of a bract.

Stamens 9-17; peduncles elongate after anthesis, penetrating the soil, the fruit hypogaeous.

Stamens usually 1-5; peduncles never penetrating the soil.

Anthocarp with 3-5 scarious wings.

Free portion of the perianth campanulate, constricted above the ovary; stamens 2 or 3, the filaments free from the perianth; flowers umbellate.

Free portion of the perianth tubular-funnelform, not constricted above the ovary; stamens 5 or 6, adherent to the perianth-tube; flowers solitary or geminate.

Anthocarp not winged, or rarely with coriaceous wings.

Anthocarp lenticular, the margins usually dentate and recurved, the dorsal surface bearing 2 rows of stipitate glands; flowers in 3's, subtended by a 3-parted involucre.

Anthocarp not lenticular, never with dentate margins.

Flowers capitate, the head surrounded by an involucre of numerous distinct bracts; perianth funnelform, with a long tube; stamens long-exserted, usually 5.

Flowers not capitate and surrounded by an involucre of numerous distinct bracts, each flower subtended by 2 or 3 bracts, or the bracts united.

Involucre of distinct bracts.

Flowers usually solitary; bracts herbaceous, persistent; perianth with a conspicuous, often much elongate tube.

Flowers not solitary, usually cymose, racemose, or umbellate; bracts scarious, usually deciduous.

Anthocarp with 5 or fewer angles or costae, obpyramidal or clavate; free portion of the perianth campanulate.

Anthocarp 10-costate; free portion of the perianth funnelform.

Flowers racemose; anthocarp asymmetric, clavate, without conspicuous glands.

Flowers not racemose; anthocarp symmetric.

Anthocarp clavate, exalate, with conspicuous stipitate mucilaginous glands; plants subscandent, slender, often fruticose at the base; leaves cauline, the blades thin.

Anthocarp turbinate or biturbinate, often with a horizontal wing, eglandular; plants erect, stout, herbaceous; leaves mostly basal, the blades coriaceous.

Involucre gamophyllous.

Anthocarp 5-sulcate, conspicuously constricted at the base; involucre strongly accrescent after anthesis, 1-5-flowered; free portion of the perianth campanulate or broadly short-salverform.

Anthocarp neither sulcate nor constricted at the base, or rarely slightly constricted.

9. HERMIDIUM.

10. OKENIA.

11. AMMOCODON.

12. SELINOCARPUS.

13. WEDELIELLA.

14. NYCTAGINIA.

15. ACLEISANTHES.

16. BOERHAAVIA.

17. CYPHOMERIS.

18. COMMICARPUS.

19. ANULOCAULIS.

20. ALLIONIA.



Involucre 3-10-flowered; free portion of the perianth salverform, with an elongate or very short, thick tube.

Perianth-tube very short; involucre nearly rotate, accrescent after anthesis, 3-flowered.

21. ALLIONIELLA.

Perianth-tube elongate; involucre campanulate, little if at all accrescent, 3-10-flowered.

22. QUAMOCLIDION.

Involucre 1-flowered.

Free portion of the perianth salverform-campanulate, the tube very short; anthocarp terete.

23. HESPERONIA.

Free portion of the perianth elongate-salverform or funnelform, the tube elongate, often much elongate and very slender; anthocarp obtusely 5-angulate.

24. MIRABILIS.

#### VI. ABRONIEAE

Wings of the anthocarp thin, transparent, extended around the body above and below it; flowers usually tetramerous; stamens 4.

25. TRIPTEROCALYX.

Wings of the anthocarp thick, opaque, not extended around the fruit but interrupted above and below, or the anthocarp often exalate; flowers pentamerous; stamens 5 or rarely more.

26. ABRONIA.

I. PISONIEAE. Shrubs or trees, or rarely only suffruticose, sometimes armed with spines. Leaves opposite. Flowers unisexual and dioecious or rarely perfect, the unisexual flowers usually with evident aborted organs of the other sex; perianth small, usually not differentiated into two parts, the free portion of the perianth of the pistillate flowers persistent upon the summit of the fruit. Anthocarp coriaceous or succulent, often with stipitate glands. Embryo straight.

#### 1. NEEA R. & P. Fl. Per. Prodr. 52. 1794.

*Neeania* Raf. Princ. Somiol. 30. 1814.

*Mitscherlichia* Kunth, Abh. Berl. Akad. 1831: 209. 1831.

*Nebra* Noronha; Choisy, in DC. Prodr. 13<sup>2</sup>: 447, as synonym. 1849.

*Eggersia* Hook. f. in Hook. Ic. 15: 1. 1883.

Shrubs or trees, erect or scandent, glabrous or pubescent, with terete or compressed branches. Leaves opposite or verticillate or rarely alternate, sometimes fasciculate, usually petiolate, the blades entire, coriaceous or herbaceous. Flowers unisexual, usually dioecious, commonly with abortive organs of the other sex, small, and white, reddish, or green, sessile or pedicellate, each usually tribracteolate at the base, arranged in axillary or terminal cymes, or sometimes solitary. Staminate perianth urceolate, globose, or elongate, shortly 4-5-dentate, the teeth induplicate-valvate. Stamens 5-10, included, inserted at the base of the perianth, the filaments unequal, the anthers oblong. Pistillate perianth urceolate or tubular, constricted above the ovary, 4-5-dentate and often contracted at the mouth. Ovary narrowly ovoid, included in the fleshy base of the perianth; style terminal, filiform, often exserted; stigma penicillate. Anthocarp ellipsoid, usually crowned by the persistent free portion of the perianth; utricle often indurate, smooth, striate, or costate. Seed with a hyaline testa adherent to the pericarp; embryo straight, the cotyledons broad; endosperm scanty, fleshy; radicle short, inferior, horizontal.

Type species, *Neea verticillata* R. & P.

Leaf-blades subcoriaceous.

Leaves all or mostly crowded, fasciculate, the blades 4-9 mm. wide.

Leaf-blades oblong to oblanceolate, 9-24 mm. long, usually cuneate at the base.

1. *N. buxifolia*.

Leaf-blades oval or oval-oblong, 7-13 mm. long, rounded or very obtuse at the base.

2. *N. Shaferi*.

Leaves distant, opposite, the blades 2-9 cm. wide.

Staminate cymes few-flowered, sparsely puberulent; leaf-blades 2.2-3 cm. wide, abruptly acuminate at the apex.

3. *N. choriophylla*.

Staminate cymes many-flowered, densely ferrugino-puberulent; leaf-blades 3.5-9 cm. wide, usually obtuse or rounded at the apex.

4. *N. rotundifolia*.

Leaf-blades herbaceous.

Blades of the principal leaves more than 3 cm. wide, sometimes 12.5 cm. wide.

- Leaf-blades glabrous or merely puberulent beneath.  
 Leaf-blades 2.5–7.5 cm. wide.  
 Stamens 8; leaf-blades obtuse at the base, about twice as long as broad.  
 Stamens usually 5; leaf-blades acute or acuminate at the base, about 3 times as long as broad.  
 Leaf-blades 9.5–12.5 cm. wide.  
 Leaf-blades copiously short-villous beneath.  
 Blades of the leaves mostly about 2 cm. wide, the largest less than 3 cm. wide.  
 Upper surface of the leaf-blades glabrous or sometimes slightly puberulent along the veins.  
 Leaves, at least the upper ones, verticillate.  
 Leaves opposite.  
 Staminate perianth conspicuously raphidulous, about as broad as long.  
 Staminate perianth obscurely if at all raphidulous, usually much longer than broad.  
 Pedicels slender, filiform, equaling or usually exceeding the perianth.  
 Pedicels stout, usually shorter than the perianth.  
 Fruit 5 mm. long; leaf-blades 1.3–2.4 cm. wide.  
 Fruit 8 mm. long; leaf-blades 2.5–3.1 cm. wide.  
 Upper surface of the leaf-blades puberulent or hirtellous, the lower surface densely hirtellous or villous.  
 Leaf-blades 0.9–1.8 cm. wide.  
 Leaf-blades 2.2–2.8 cm. wide.
5. *N. nigricans*.  
 6. *N. psychotrioides*.  
 7. *N. Pittieri*.  
 8. *N. amplifolia*.  
 9. *N. tenuis*.  
 10. *N. sphaerantha*.  
 11. *N. delicatula*.  
 12. *N. demissa*.  
 13. *N. coccinea*.  
 14. *N. subcoccinea*.  
 15. *N. fagifolia*.

1. *Neea buxifolia* (Hook. f.) Heimerl, Bot. Jahrb. 21: 633. 1896.

*Eggersia buxifolia* Hook. f. in Hook. Ic. 15: 1. 1883.

Shrub or small tree, 3–8 meters high, the branchlets virgate, slender, grayish, densely leafy, the younger ones ferrugino-puberulent; leaf-blades oblong, oblong-ovate, oblong-elliptic, or oblanceolate, 9–24 mm. long, 4–9 mm. wide, broadly rounded or obtuse at the apex, sessile or narrowed at the base to a stout petiole 1–2 mm. long, glabrous, deep-green, rigidly coriaceous, the margins often revolute, the lateral veins obsolete; peduncles 4–5 mm. long, slender, rufo-puberulent; bractlets 1 mm. long, puberulent; staminate perianth ovoid or sub-urceolate, 3.5 mm. long, ferrugino-puberulent or glabrate, obtusely 5-dentate; stamens 5–8, 1.5–3 mm. long; pistillate perianth subtubular, 3 mm. long, sparsely puberulent, slightly contracted in the throat, 5-dentate, the teeth unequal, ovate-deltoid; fruit not known.

TYPE LOCALITY: On Flag Hill, St. Thomas, at an altitude of 320 meters.

DISTRIBUTION: On rocky hillsides, Porto Rico and the Virgin Islands.

ILLUSTRATION: Hook. Ic. *pl.* 1401.

2. *Neea Shaferi* Standley, sp. nov.

Shrub, 1.2–1.5 meters high, much branched, the branches stout, brown or grayish-brown, glabrous; leaves crowded and fasciculate on short, stout lateral spurs, the petioles stout, 1–2 mm. long, ferrugino-puberulent, the blades oval or oval-oblong, 7–13 mm. long, 4–7 mm. wide, broadly rounded at the apex, rounded or obtuse at the base and slightly asymmetric, coriaceous, glabrous, dark-green, the midvein conspicuous, stout, the lateral veins obsolete; fruit elliptic-oblong in outline, 6–7 mm. long, red, striate.

Type collected at Punta Maisi, Oriente, Cuba, December 14, 1910, *J. A. Shafer 7921* (herb. N. Y. Bot. Gard.).

3. *Neea choriophylla* Standley, Contr. U. S. Nat. Herb. 13: 384. 1911.

Branches stout, terete, pale-gray or brown, glabrous, the branchlets stout, sparsely ferrugino-puberulent when young but soon glabrate, the internodes short; petioles stout, 4–10 mm. long; leaf-blades oval, oval-oblong, or obovate-oval, broadest at or above the middle, 4.5–7 cm. long, 2–3 cm. wide, broadly cuneate at the base, abruptly acuminate at the apex with a narrowly triangular acutish acumen 7–15 mm. long, subcoriaceous, dull yellowish-green, concolorous, slightly undulate, sparsely puberulent beneath when young but soon glabrate, raphidulous beneath, the margins plane, the lateral veins evident beneath, arcuate-ascending, 5–8 on each side; peduncles of the pistillate cymes 1.5–3 cm. long, slender, sparsely puberulent



or glabrate, the cymes many-flowered, dense, at least in anthesis, 1.5–3 cm. broad, the branches ferrugino-puberulent, the flowers sessile or on stout pedicels 3 mm. long or shorter; bractlets triangular-oblong, acute, 1 mm. long or shorter, puberulent; pistillate perianth tubular-infundibuliform, 3 mm. long, narrowed at the base, minutely and sparsely puberulent, 4-dentate; style slightly exserted; staminate inflorescence and fruit not known.

TYPE LOCALITY: Yucatán.

DISTRIBUTION: Known only from the type locality.

#### 4. *Neea rotundifolia* Heimerl, Symb. Ant. 7: 218. 1912.

Tree, 9 meters high; branches gray, glabrous, the branchlets very stout, densely ferrugino-puberulent when young, glabrate in age, densely leafy; leaves opposite, the petioles stout, 0.9–2.4 cm. long, the blades oval, broadly oval, or rounded-oval, 6–14 cm. long, 3.3–9 cm. wide, rounded or obtuse at the apex or rarely shortly and abruptly acuminate, rounded or obtuse at the base, thin-coriaceous, deep-green, slightly lustrous on the upper surface and sparsely puberulent when young, beneath dull and sparsely puberulent, subundulate, the margins somewhat revolute, the lateral veins 5–10 on each side, slightly arcuate, the veinlets reticulate, conspicuous beneath; peduncles of the staminate cymes stout, 4–5 cm. long, ferrugino-puberulent, the cymes many-flowered, 6–7 cm. broad, the primary branches radiately spreading, the flowers sessile or subsessile, the bractlets ovate-triangular, 0.5 mm. long, acutish; peduncles of the pistillate cymes terminal or axillary, 2.5–5 cm. long, stout, the cymes 7–13 cm. broad, the primary branches opposite or alternate, divaricate, stout, densely puberulent, the flowers sessile or very shortly and stoutly pedicellate, the bractlets ovate-triangular, 0.5–1 mm. long, densely puberulent; free part of the pistillate perianth 1.5–2 mm. long and 1.5–2 mm. wide; anthocarp 5–7 mm. long, ellipsoid, glabrous or obscurely puberulent; utricle 5–6 mm. long, finely striate.

TYPE LOCALITY: Peckham Woods, Upper Clarendon, Jamaica.

DISTRIBUTION: Clarendon Parish, Jamaica.

#### 5. *Neea nigricans* (Sw.) Heimerl, Symb. Ant. 7: 218. 1912.

*Pisonia nigricans* Sw. Fl. Ind. Occ. 643. 1800.

*Neea jamaicensis* Griseb. Fl. Brit. W. Ind. 71. 1859.

Tree, 5–15 meters high, the branches stout, grayish, glabrous, the branchlets stout, densely ferrugino-puberulent when young, glabrate in age, the internodes usually short; leaves opposite, the petioles rather slender, 0.4–2.6 cm. long, the blades oval to elliptic-oblong, 5–17.5 cm. long, 2.5–7.5 cm. wide, obtuse to acutish at the base, abruptly acuminate or cuspidate-acuminate at the apex, with a triangular or narrowly triangular, acute or acuminate acumen, thin, deep-green, slightly lustrous and glabrous above, slightly paler beneath and very sparsely puberulent along the veins or glabrous, the margins plane or subrevolute, the lateral veins prominent beneath, 7–11 on each side, divaricate, straight or slightly arcuate; peduncles of the staminate cymes 1.5–6 cm. long, terminal and axillary, rather slender, sparsely puberulent or glabrate, the cymes many-flowered, loosely branched, 5–7 cm. wide, the branches mostly alternate, ascending or divaricate, densely puberulent, the flowers subsessile or short-pedicellate, the bractlets lance-subulate, 1 mm. long, puberulent, the perianth suburceolate, 4–5 mm. long, sparsely puberulent; stamens 8, unequal; pistillate cymes similar to the staminate ones, 5–10 cm. broad, the peduncles 1.5–9 cm. long, the flowers sessile or short-pedicellate, the perianth broadly tubular-funnelform, 4–5 mm. long, puberulent, 4-dentate, the teeth triangular, obtuse or acutish; fruit broadly oblong, 10–11 mm. long, 5–6 mm. in diameter, the free portion of the perianth 1.5 mm. long and as broad or broader, the utricle 7–9 mm. long, coarsely costate; seed oblong, 5 mm. long, light-brown, finely striate.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Fawc. & Rendle, Fl. Jam. 3: f. 52.

#### 6. *Neea psychotrioides* Donn. Smith, Bot. Gaz. 16: 199. 1891.

Shrub, 2–3 meters high, the branchlets terete, ferrugino-puberulent when young, glabrate in age, the internodes usually elongate; leaves opposite or the uppermost verticillate, the



petioles slender, 2–14 mm. long, the blades elliptic, elliptic-oblong, or narrowly obovate-oblong, 7.5–19 cm. long, 1.6–6.3 cm. wide, cuneate or broadly cuneate at the base, somewhat abruptly acute or acuminate at the apex, with a usually obtuse acumen, thin, deep-green, concolorous, glabrous or sparsely and minutely puberulent beneath along the veins, the margins plane or obscurely revolute, the lateral veins evident beneath, 6–12 on each side, divergent, straight or arcuate; peduncles of the staminate cymes 2.5–12 cm. long, terminal and axillary, slender, puberulent or glabrate, the cymes loosely branched, 5–12 cm. broad, many-flowered, the branches slender, ascending or divaricate, densely ferrugino-puberulent, the flowers subsessile or on slender pedicels 1–5 mm. long, the bractlets triangular-oblong or subulate, 1 mm. long, puberulent, the perianth tubular or suburceolate, 4–8 mm. long, acute at the base, slightly constricted at the mouth, minutely puberulent; stamens 5; peduncles of the pistillate cymes slender, 4–6 cm. long, the cymes 4–9 cm. broad, loosely branched, the branches divaricate, puberulent, the flowers on stout pedicels 0.5–3 mm. long, or sometimes subsessile, the perianth tubular, 3–4 mm. long, puberulent, 5-dentate, the teeth ovate-deltoid, acute; style lightly exerted; fruit 7–9 mm. long, oblong-ellipsoid, the free portion of the perianth 1 mm. long and usually broader; utricle finely striate; seed oblong, 6 mm. long, pale-brown, finely striate.

TYPE LOCALITY: Escuintla, Guatemala, at an altitude of 330 meters.

DISTRIBUTION: Guatemala to Costa Rica.

7. *Neea Pittieri* Standley, Contr. U. S. Nat. Herb. 13: 383. 1911.

A shrub or small tree, the older branches stout, gray, the branchlets stout, compressed, sparsely and minutely puberulent when young, glabrate in age, the internodes usually elongate; leaves opposite and alternate, the petioles stout, 0.7–2.5 cm. long, the blades oval, ovate-oval, or rounded-ovate, 19–30 cm. long, 9.5–12.5 cm. wide, broadest at or below the middle, rounded or obtuse at the base, abruptly cuspidate-acuminate at the apex or rarely gradually acuminate, with a triangular or linear-triangular, acuminate or attenuate acumen, the blades thin, deep-green above, sparsely puberulent and minutely punctulate, beneath slightly paler, minutely puberulent and raphidulous, the margins plane or subrevolute, the lateral veins prominent beneath, 11–14 on each side, widely arcuate-ascending; peduncles of the staminate cymes 3.5–7.5 cm. long, terminal, rather slender, densely puberulent, or glabrate in age, the cymes many-flowered, 5–12 cm. broad, the slender branches divaricate, the flowers on pedicels 1–3 mm. long, the bractlets linear-lanceolate, 1–1.5 mm. long, acuminate, puberulent, the perianth tubular, slightly constricted at the throat, 7–9 mm. long, puberulent, 5-dentate, the teeth triangular-ovate, acute; stamens 5–10, very unequal, the longest filaments 5 mm. long, the anthers 1.5–2 mm. long; pistillate cymes similar to the staminate ones, 5–6 cm. broad, on peduncles 2.5–5.5 cm. long, the branches stouter, the flowers subsessile or on stout pedicels 5 mm. long, the perianth tubular, 7–8 mm. long, puberulent, the style included; fruit 8–9 mm. long, oblong-ellipsoid, the utricle obscurely costate; seed ellipsoid, 6 mm. long, brown, smooth.

TYPE LOCALITY: Valley of Tuís, Costa Rica, at an altitude of 1000 meters.

DISTRIBUTION: Costa Rica and Panama.

8. *Neea amplifolia* Donn. Smith, Bot. Gaz. 61: 386. 1916.

Shrub, 0.5–1 meter high, the young branches stout, ferrugino-puberulent or glabrate, the internodes elongate; leaves opposite, the petioles stout, 2–3 cm. long, ferrugino-puberulent, the blades obovate, oval, or oval-elliptic, 19–27 cm. long, 8–9 cm. wide, broadest at or sometimes above the middle, obtuse or cuneate at the base, abruptly cuspidate-acuminate or attenuate at the apex, thin, deep-green, concolorous, sparsely puberulent or glabrate above, copiously short-villous beneath with fulvous hairs, the lateral veins prominent, arcuate-ascending; peduncles of the staminate cymes axillary, 6–12 cm. long, very slender, the cymes loosely many-flowered, 4.5–7 cm. long, the branches divaricate, ferrugino-puberulent, the flowers on pedicels 1–3 mm. long, the bractlets ovate, 2 mm. long; staminate perianth tubular, 10–12 mm. long, constricted in the throat, puberulent, 5-dentate, the teeth triangular, acute; stamens 8, the longer filaments 5 mm. long, the anthers 1 mm. long; fruit not known.

TYPE LOCALITY: In forests along the Río Hondo near Madre de Dios, Comarca de Limón, Costa Rica, at an altitude of 200 meters.

DISTRIBUTION: Costa Rica.



9. *Neea tenuis* Standley, Contr. U. S. Nat. Herb. 13: 384. 1911.

Branches slender, smooth, brownish, glabrous; leaves opposite, or the upper verticillate, the petioles about 3 mm. long, the blades elliptic-oblong or lance-elliptic, 4.4–5 cm. long, 1.4–1.9 cm. wide, broadest at or slightly below the middle, obtuse or acutish at the base, rather abruptly attenuate or long-acuminate at the apex, thin, glabrous; peduncles of the staminate cymes 6–7 cm. long, slender, almost filiform, flexuous, pendulous, glabrous, the cymes loosely many-flowered, 4 cm. wide and about as long, the slender branches spreading, sparsely rufo-puberulent or glabrate, the bractlets lance-subulate, the pedicels filiform, equaling or longer than the flowers, the perianth urceolate, 3–4 mm. long, glabrous or nearly so; stamens 6, one third as long as the perianth, the filaments unequal; pistillate flowers and fruit not known.

TYPE LOCALITY: About Orizaba, Veracruz.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 13: pl. 74.

10. *Neea sphaerantha* Standley, Contr. U. S. Nat. Herb. 13: 384. 1911.

Branches slender, grayish, smooth, glabrous; leaves opposite, the petioles 4–10 mm. long, the blades oblong or oval to elliptic-oblong, 1.7–5.3 cm. long, 0.9–2 cm. wide, obtuse or acutish at the apex, rounded or broadly cuneate at the base; peduncles of the staminate cymes 2.2–4 cm. long, slender, glabrous, the cymes many-flowered, 4 cm. broad or less, the branches sparsely puberulent or glabrate, the bractlets lanceolate, the perianth urceolate, 4–5 mm. long and nearly as broad, short-pedicellate, raphidulous, obscurely 4-dentate at the apex; stamens 6, unequal, slightly more than half as long as the perianth; pistillate flowers and fruit not known.

TYPE LOCALITY: Izamal, Yucatán.

DISTRIBUTION: Known only from the type locality.

11. *Neea delicatula* Standley, Contr. U. S. Nat. Herb. 18: 98. 1916.

Branches slender, greenish-gray, glabrous, the branchlets slender, ferrugino-puberulent when young but soon glabrate, the internodes short; leaves mostly opposite, the petioles slender, 4–7 mm. long, the blades elliptic, elliptic-obovate, or oblong-oval, 2.2–6 cm. long, 0.9–2 cm. wide, cuneate to acutish at the base, abruptly acuminate at the apex with a narrowly triangular acutish or usually obtuse acumen, thin, deep-green, concolorous, glabrous and dull on the upper surface, sparsely rufo-puberulent beneath along the costa, the margins plane, the lateral veins obsolete or nearly so; peduncles of the staminate cymes 2.2–4.5 cm. long, terminal and axillary, nearly filiform, flexuous, glabrous, the cymes few- or many-flowered, 2–5 cm. wide, the flowers on slender pedicels 4–15 mm. long, the bractlets triangular-oblong, acute, 1 mm. long, puberulent, the perianth urceolate, acutish at the base, 4.5 mm. long, 3 mm. wide, puberulent at the apex, elsewhere glabrate, minutely 5-dentate; stamens 7, the filaments very unequal, the anthers 1 mm. long; pistillate flowers and fruit not known.

TYPE LOCALITY: In forests on dry limestone around Alhajuela, Chagres Valley, Panama, altitude 30 to 100 meters.

DISTRIBUTION: Panama.

12. *Neea demissa* Heimerl, Symb. Ant. 7: 219. 1912.

Small tree, the branchlets flexuous, spreading, slender, grayish-brown, densely ferrugino-puberulent when young, glabrate in age; leaves opposite, the petioles slender, 6–13 mm. long, the blades lanceolate, widest at the middle, nearly equally long-acuminate or narrowed at both ends, 3.7–6.6 cm. long, 1.3–2.4 cm. wide, thin-chartaceous, punctulate above and sparsely short-pilose along the nerves, beneath minutely striolate, the lateral nerves 5–7 on each side, arcuate; peduncles of the pistillate cymes 1–2.5 cm. long, slender, the cymes few-flowered, 1.5 cm. long and 1 cm. wide, the branches few, alternate, ascending, the flowers solitary,

sessile, the bractlets 3, linear-lanceolate, acutish, 1–1.5 mm. long, the perianth 3.5 mm. long, white, at first suburceolate, finally tubular-infundibuliform, sparsely short-hirtellous with rufous hairs, the limb shortly 5-dentate, erect, 2 mm. wide; style equaling or slightly exceeding the perianth; fruit subglobose, bright reddish-violet, 7 mm. long, 4–5 mm. thick, the utricle ellipsoid, 5 mm. long, 2.5 mm. thick.

TYPE LOCALITY: In a moist valley near Tiburon, Haïti.

DISTRIBUTION: Known only from the type locality.

13. *Neea coccinea* (Sw.) Heimerl, Bot. Jahrb. 21: 635. 1896.

*Pisonia coccinea* Sw. Prodr. 60. 1788.

Shrub, 1–2 meters high, the branches slender, flexuous, glabrous, grayish, the branchlets spreading, puberulent when young, leafy near the ends; leaves mostly alternate, the petioles slender, 1–2 cm. long, the blades broadly elliptic-lanceolate, broadest at the middle, 5–6.3 cm. long, 2.5–3.1 cm. wide, contracted at the base, obtuse to acuminate at the apex, herbaceous, glabrous, deep-green above, slightly paler beneath, the lateral veins not prominent, arcuate, 3–7 on each side; peduncles terminal, glabrous, 3–4 cm. long, filiform, the flowers 3–5, subracemose or cymose, sessile or on pedicels 2 mm. long or shorter, glabrous; bractlets 1–1.5 mm. long, linear-lanceolate, glabrate; staminate perianth suburceolate, 6 mm. long, the teeth broadly deltoid, acutish, erect; stamens usually 7, 3–4.5 mm. long, the anthers 1.5 mm. long; pistillate perianth narrowly tubular, 3 mm. long, scarcely constricted in the throat, shortly 5-dentate, the teeth obtuse; fruit oblong-ellipsoid, 8 mm. long, 3 mm. in diameter, scarlet.

TYPE LOCALITY: Hispaniola.

DISTRIBUTION: Hispaniola.

14. *Neea subcoccinea* Heimerl, Symb. Ant. 7: 219. 1912.

Small tree, the branches glabrous, the branchlets slender, grayish-brown or rufescent, densely rufo-hirtellous when young, finally glabrate; leaves opposite or alternate, the petioles slender, 3–9 mm. long, the blades ovate-elliptic to elliptic-lanceolate, 1.3–4.4 cm. long, 0.9–1.8 cm. wide, broadest near the middle, acute to rounded at the apex, acute or obtuse at the base and short-decurrent, deep-green and sparsely hirtello-puberulent on the upper surface, densely hirtellous beneath, the lateral nerves 5–7 on each side, slightly arcuate, inconspicuous; peduncles of the staminate cymes 1–1.6 cm. long, slender, terminal and axillary, few-flowered, the flowers usually 2–5, subspicate or subcapitate, yellow, subsessile or on pedicels 1 mm. long or shorter, the perianth 5 mm. long, 3 mm. wide, urceolate, glabrate; stamens 7, 2–3.5 mm. long; pistillate flowers and fruit not known.

TYPE LOCALITY: Near Barahona, Santo Domingo.

DISTRIBUTION: Known only from the type locality.

15. *Neea fagifolia* Heimerl, Beitr. Syst. Nyct. 39. 1897.

Branchlets sparsely tomentulose, glabrate in age, leafy at the apex, the internodes short; leaves opposite, the petioles 6–8 mm. long, the blades elliptic-lanceolate, 4.2–5.7 cm. long, 2.2–2.8 cm. wide, widest at the middle, attenuate to the acutish apex and the cuneate base, thin, lustrous above and glabrate, densely short-villous beneath; peduncles of the staminate inflorescence 2–3 cm. long, the cymes short-pyramidal, the branches slender, the flowers sessile or very short-pedicellate, the perianth ellipsoid, 5 mm. long, shortly but distinctly narrowed at both ends, glabrous, 5-dentate, the teeth acute; stamens 6, unequal, half as long as the perianth; pistillate flowers and fruit not known.

TYPE LOCALITY: Granada, Nicaragua.

DISTRIBUTION: Known only from the type locality.

2. *CEPHALOTOMANDRA* Karst. & Triana; Karst. Linnaea 28: 429.  
1856.

Trees or shrubs, more or less pubescent. Leaves opposite, petiolate, the blades entire. Flowers dioecious, small, yellowish or reddish, tribracteolate, pedicellate, arranged in terminal



long-pedunculate many-flowered cymes. Staminate perianth urceolate-campanulate, abruptly constricted below the middle, the limb broad, shallowly 5-lobed, the lobes plicate-valvate. Stamens numerous, usually 25–30, included, the filaments stout, unequal, the anthers oblong. Pistillate perianth with a 5-lobed limb, this persistent. Ovary ovoid, sessile, attenuate to a filiform style, this stigmatose on the inner side. Anthocarp woody, longitudinally costate. Seed with a membranaceous testa adherent to the pericarp; embryo straight, the cotyledons cordate, enclosing the scanty endosperm, the radicle inferior.

Type species, *Cephalotomandra fragrans* Karst. & Triana.

### 1. *Cephalotomandra panamensis* Standley, sp. nov.

Young branches stout, brownish, glabrous; petioles stout, 2–2.5 cm. long, glabrous, shallowly canaliculate on the upper side; leaf-blades oval, oblong-oval, or ovate-oval, 11–20 cm. long, 5.7–11 cm. wide, rounded or subcordate at the base and very abruptly short-decurrent, acute or acutish at the apex, subcoriaceous, bright-green, glabrous, the costa coarse and prominent, the lateral veins slender, prominent, 6–8 on each side, distant, ascending; peduncles stout, 9–12 cm. long, glabrous, the cymes 6–8 cm. wide, divaricately branched, the branches puberulent, the pedicels stout, 1–4 mm. long; staminate perianth 3–4 mm. long, glabrous or obscurely puberulent, the limb 3 mm. broad, the lobes very short, obtuse; fruit ellipsoid, 12–14 mm. long, 5–6 mm. in diameter, glabrous, coarsely costate; seed ellipsoid, reddish-brown, 7 mm. long.

Type collected in Panama, *Sutton Hayes 998* (herb. Columbia Univ.).

### 3. *TORRUBIA* Vell. Fl. Flum. 139. 1827.

*Bessera* Vell. Fl. Flum. 147. 1827. Not *Bessera* Schultes f. 1809.

*Columella* Vell. Fl. Flum. 155. 1827. Not *Columella* Lour. 1790.

Shrubs or trees, unarmed, glabrous or pubescent. Leaves mostly opposite, usually petiolate, the blades entire, often thick-coriaceous. Flowers dioecious, small, reddish, yellowish-green, or greenish-white, exinvolucrate, 2–3-bracteolate, sessile or pedicellate, arranged in lateral or terminal pedunculate cymes. Staminate perianth obconic-campanulate, the limb 5-dentate, the teeth short, induplicate-valvate. Stamens 6–10, exserted, the filaments unequal, filiform, short-connate at the base, the anthers oblong. Pistillate perianth tubular, the limb narrow, shallowly 5-dentate. Ovary elongate-ovoid, sessile, attenuate to the usually short-exserted style, the stigma penicillate. Anthocarp drupaceous, the exocarp fleshy, juicy, red to black, the utricle elongate, papyraceous or coriaceous, striate. Seed with a hyaline testa adherent to the pericarp; embryo straight, the cotyledons broad, enclosing the scanty endosperm, the radicle short, inferior.

Type species, *Torrubia opposita* Vell.

Leaf-blades thick-coriaceous; petioles usually very stout.

Petioles 1–2 mm. long; leaf-blades 4 cm. long or shorter, mostly orbicular, glabrous or nearly so.

Petioles 3–20 mm. long; leaf-blades 6–11.5 cm. long.

Leaf-blades densely ferrugino-puberulent beneath; petioles 3–10 mm. long.

Leaf-blades glabrous or nearly so.

Pistillate perianth tubular to tubular-funnelform, not constricted at the mouth; perianth and branches of the inflorescence glabrate.

Pistillate perianth ellipsoid-oblong, constricted at the mouth; perianth and branches of the inflorescence densely ferrugino-puberulent.

Leaf-blades very thinly coriaceous; petioles usually slender.

Leaf-blades rounded at the apex, often emarginate.

Leaves densely puberulent.

Leaves glabrous or nearly so.

Leaf-blades oval or oblong, broadest at the middle.

Leaf-blades oblanceolate or obovate, broadest above the middle.

Fruit globose-obovoid, little longer than thick, 5–6 mm. long.

Fruit ellipsoid-oblong, twice as long as thick, 7–8 mm. long.

Leaf-blades obtuse or acutish to long-attenuate at the apex, never rounded.

1. *T. suborbiculata*.

3. *T. rufescens*.

2. *T. ligustrifolia*.

4. *T. obtusata*.

5. *T. floridana*.

6. *T. discolor*.

7. *T. longifolia*.

8. *T. Bracei*.

- Leaves densely ferrugino-puberulent when young, glabrate in age except along the veins. 9. *T. cuspidata*.  
 Leaves glabrous or nearly so, even when young.  
 Leaf-blades broadest at the middle, often elliptic, usually long-acuminate at the apex.  
 Inflorescence lax, few-flowered; leaf-blades oval or oblong-oval. 10. *T. potosina*.  
 Inflorescence dense, many-flowered; leaf-blades mostly narrowly elliptic.  
 Leaf-blades 8–11 cm. long; bracts about 1 mm. long. 11. *T. costaricana*.  
 Leaf-blades 7.5 cm. long or less; bracts 1.5–3.5 mm. long. 12. *T. linearibracteata*.  
 Leaf-blades mostly broadest above the middle, never elliptic nor long-acuminate.  
 Staminate perianth 6–7 mm. long, nearly glabrous. 13. *T. Dussii*.  
 Staminate perianth 3.5–5 mm. long, copiously puberulent.  
 Stamens usually 9; leaf-blades thick. 14. *T. coriifolia*.  
 Stamens 6–8; leaf-blades thin.  
 Flowers solitary in the cymes, long-pedicellate, densely puberulent. 15. *T. panamensis*.  
 Flowers glomerate in the cymes, sessile or very short-pedicellate, sparsely puberulent.  
 Lateral nerves of the leaves numerous, with numerous fine, conspicuously reticulate veinlets. 16. *T. fragrans*.  
 Lateral nerves of the leaves few, 6–9 on each side, distant, the intermediate veinlets inconspicuous. 17. *T. Harrisiana*.

1. *Torrubia suborbiculata* (Hemsl.) Britton, Bull. Torrey Club  
 31: 613. 1904.

*Pisonia obtusata* Heimerl, Bot. Jahrb. 21: 624, in part. 1896. Not *P. obtusata* Jacq. 1798.  
*Pisonia suborbiculata* Hemsl.; Duss, Ann. Inst. Colon. Marseilles 3: 62. 1897.

Low shrub, 2.5 meters high or less, the branches stout, rugulose, grayish or yellowish, the branchlets stout or slender, sparsely puberulent when young but soon glabrate, the internodes 0.2–2 cm. long; leaves opposite, subequal or very unequal, the petioles stout, 1–2 mm. long, 1 mm. thick, the blades orbicular, rounded-oval, or oval, 1.6–3.5 cm. long, 1.1–2.5 cm. wide, rounded or obtuse at the base, broadly rounded or rarely only obtuse at the apex, coriaceous, glabrous, the margins often slightly revolute, the lateral veins prominent beneath, 4–6 on each side, anastomosing near the margins, the veinlets prominent, coarsely reticulate; staminate peduncles 1.3–2.5 cm. long, very slender, sparsely puberulent or glabrate, the inflorescence few-flowered, cymose, 1.5 cm. broad, the flowers mostly solitary, on pedicels 0.5–2 mm. long, the bractlets linear or oblong, sparsely puberulent, the perianth tubular-funnelform, 2–2.5 mm. long, glabrous, the lobes short, obtuse; pistillate peduncles 1.2–2.2 cm. long, slender, sparsely puberulent or glabrate, the inflorescence subcorymbose, 1.5–2 cm. broad, few-flowered, lax, the branches opposite or alternate, short, glabrate, the flowers solitary, on pedicels 1–4 mm. long, the bractlets linear or linear-oblong, 1 mm. long, obtuse, glabrous or nearly so; fruit ellipsoid-oblong, 8 mm. long and 3 mm. in diameter, red and glaucous at maturity, the utricle finely striate; seed ellipsoid, 6 mm. long, dark-brown, finely striate.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Martinique.

2. *Torrubia ligustrifolia* (Heimerl) Standley, Contr. U. S. Nat.  
 Herb. 18: 100. 1916.

*Pisonia ligustrifolia* Heimerl, Symb. Ant. 7: 507. 1913.

Branches slender, grayish, substriate, the internodes 0.9–5.2 cm. long, the branchlets at first sparsely rufo-hirtellous, soon glabrate; leaves opposite, subequal, the petioles 5 mm. long or less and 2 mm. thick, glabrous, the blades elliptic, 4.4–7.2 cm. long, 1.9–3.3 mm. wide, usually widest at the middle and slightly more than twice as long as wide, nearly equally rounded at both ends, thick-coriaceous, concolorous, dull or sublustrous, glabrous, the margins revolute, the midvein very prominent beneath, the lateral veins numerous, slender, straight, connected by numerous reticulate veinlets; pistillate peduncles 3 cm. long, stout, glabrate, the inflorescence corymbose, many-flowered, the primary branches trichotomous, very sparsely rufo-hirtellous or glabrate, the flowers solitary, subsessile or on pedicels 2 mm. long or shorter,



the bractlets triangular-lanceolate, acutish, 1 mm. long, the perianth tubular or tubular-funnelform, 4 mm. long, 1.5–2 mm. wide, the limb suberect, the 5 teeth sublanceolate, sub-obtuse; style exserted; fruit (immature) 8 mm. long and 3 mm. thick, fusiform-ellipsoid.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Known only from the type locality.

3. *Torrubia rufescens* (Heimerl) Britton, Bull. Torrey Club 31: 613. 1904.

*Pisonia calophylla rufescens* Heimerl, Bot. Jahrb. 21: 626. 1896.

*Pisonia rufescens* Griseb.; Heimerl, Bot. Jahrb. 21: 626, as synonym. 1896.

Branches stout, gray, striolate, glabrous, the branchlets stout, densely ferrugino-puberulent, the internodes 1.5–2.5 cm. long; leaves opposite, subequal or very unequal, the petioles stout, 0.3–1 cm. long, 2 mm. thick, the blades rounded-obovate to broadly oval, 4.2–5.6 cm. long, 2.8–4.5 cm. wide, broadly cuneate or obtuse at the base, broadly rounded or truncate at the apex, when young densely ferrugino-tomentulose on both surfaces, in age glabrous on the upper surface, thick-coriaceous, the margins plane, the lateral nerves nearly obsolete; staminate inflorescence cymose, 5 cm. broad, the flowers sessile or subsessile, the branches densely rufo-puberulent, the perianth narrowly campanulate, 3.5 mm. long, densely ferrugino-puberulent; stamens half longer than the perianth; pistillate flowers and fruit not known.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Eastern Cuba.

4. *Torrubia obtusata* (Jacq.) Britton, Bull. Torrey Club 31: 612. 1904.

*Pisonia obtusata* Jacq. Hort. Schoenbr. 3: 36. 1798.

*Psidium cordatum* Griseb. Fl. Brit. W. Ind. 242, in part. 1860. Not *P. cordatum* Sims, 1816.

*Psidium ? pulverulentum* Krug & Urban, Bot. Jahrb. 19: 567. 1894.

*Pisonia calophylla* Heimerl, Bot. Jahrb. 21: 625. 1896.

*Torrubia Cokeri* Britton, Bull. Torrey Club 31: 613. 1904.

*Pisonia obtusata domingensis* Heimerl, Symb. Ant. 7: 215. 1912.

*Torrubia domingensis* Standley, Contr. U. S. Nat. Herb. 18: 100. 1916.

Shrub or tree, 8 meters high or less, the branches stout, gray, the branchlets stout, rufo-puberulent when young, glabrate in age, spreading or ascending, the internodes 0.5–3 cm. long; leaves opposite, subequal, the petioles stout, 0.3–2 cm. long, 1.5–2 mm. thick, rufo-puberulent, the blades broadly oval, obovate-oval, oblong, or rounded-obovate, 4.5–11.5 cm. long, 2.5–7 cm. wide, broadly rounded to cuneate at the base, broadly rounded at the apex, sometimes shallowly emarginate, thick-coriaceous, concolorous or slightly paler beneath, lustrous above, dull beneath, often sparsely puberulent beneath when young but soon glabrate, the margins revolute, the lateral veins slender, numerous, straight, the veinlets prominently and finely reticulate; peduncles terminal, stout or slender, 1.5–5 cm. long, sparsely rufo-puberulent or glabrate, the inflorescence cymose, many-flowered, 3–7 cm. broad, the branches slender or stout, divaricate, opposite or verticillate, sparsely puberulent, the flowers sessile or on pedicels 1–2 mm. long, the bractlets ovate, 1 mm. long, puberulent; staminate perianth funnelform, 3–5 mm. long, sparsely puberulent, greenish-white, the limb obtusely 5-dentate; stamens usually 6, twice as long as the perianth; pistillate perianth oblong-ellipsoid, 2.5–3 mm. long, slightly constricted below the apex, obtusely 5-dentate; fruit 6–7 mm. long, 3–3.5 mm. in diameter, bright-red, coarsely striate; seed oblong, 4.5 mm. long, brown, striate.

TYPE LOCALITY: Island of New Providence, Bahamas.

DISTRIBUTION: Low thickets, usually near the sea, Bahamas, Cuba, Santo Domingo, and Jamaica.

ILLUSTRATION: Jacq. Hort. Schoenbr. 3: pl. 314.

5. *Torrubia floridana* Britton, Bull. Torrey Club 31: 615. 1904.

*Pisonia floridana* Britton; Small, Fl. SE. U. S. 411. 1903.

A low shrub with irregular branches; petioles slender 3–8 mm. long; leaf-blades oval-obovate or cuneate-obovate, 1–3 cm. long, 0.6–1.3 cm. wide, cuneate at the base, rounded at the apex, densely puberulent; pistillate cymes few-flowered, terminal, 1–3 cm. broad, on

peduncles 1–1.7 cm. long, the branches densely puberulent, the perianth tubular, 2 mm. long, glabrate, 5-dentate, the teeth short, obtuse; anthocarp elliptic-oblong, 6–7 mm. long.

TYPE LOCALITY: Rock Key, Florida.

DISTRIBUTION: Known only from the type locality.

6. *Torrubia discolor* (Spreng.) Britton, Bull. Torrey Club 31: 613. 1904.

*Pisonia discolor* Spreng. Syst. 2: 168. 1825.

*Pisonia discolor latifolia* Heimerl, Bot. Jahrb. 21: 627. 1896.

*Pisonia discolor intermedia* Heimerl, Bot. Jahrb. 21: 627. 1896.

*Pisonia discolor brevipetiolata* Heimerl, Symb. Ant. 7: 215. 1912.

Shrub or small tree, the branches slender, subvirgate, brown or grayish, rugulose, the branchlets slender, grayish or yellowish, sparsely ferrugino-puberulent or usually glabrous, the internodes commonly short; leaves opposite or alternate, often crowded, subequal, the petioles usually slender and 0.5–1.3 cm. long, rarely only 3 mm. long, glabrous or sparsely puberulent, the blades oblong-elliptic to oval, rarely obovate-oval or rounded-ovate, usually broadest at or below the middle, 2–6.5 cm. long, 0.7–4 cm. wide, broadly rounded to acute at the base, broadly rounded to acutish at the apex, thin, glabrous, deep-green above and lustrous, paler beneath and usually dull, the lateral veins obscure, laxly anastomosing near the margin; peduncles slender, axillary and terminal, 1–2 cm. long, glabrous or nearly so, the inflorescence laxly paniculate or racemose, few-flowered, 1–2 cm. broad, the flowers sessile or subsessile, the bractlets ovate or oblong, minute; staminate perianth tubular-campanulate, 4–4.5 mm. long, glabrous, minutely denticulate; stamens 6–8, less than twice as long as the perianth; pistillate perianth ellipsoid-oblong, 3 mm. long or less, constricted below the apex; style longer than the perianth; fruit 5–7 mm. long, ellipsoid-oblong, scarlet, the utricle 10-striate.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Greater Antilles.

7. *Torrubia longifolia* (Heimerl) Britton, Bull. Torrey Club 31: 614. 1904.

*Pisonia obtusata* Chapm. Fl. S. U. S. 374. 1860. Not *P. obtusata* Jacq. 1798.

*Pisonia discolor longifolia* Heimerl, Bot. Jahrb. 21: 627. 1896.

*Pisonia longifolia* Sarg. Man. 314. 1905.

Shrub or tree, sometimes 16 meters high, the smooth trunk sometimes 5 dm. in diameter, the branches stout or slender, brownish or gray, the branchlets slender, yellowish or gray, glabrous, or ferrugino-puberulent about the nodes, the internodes usually short; leaves opposite and alternate, subequal, the petioles slender, 0.6–1.6 cm. long, glabrous, the blades narrowly oblanceolate to obovate or rounded-obovate, 2.5–6.9 cm. long, 0.7–2.8 cm. broad, cuneate or usually cuneately long-acuminate or long-attenuate at the base, broadly rounded at the apex, often emarginate, thin, glabrous, deep-green above and lustrous, slightly paler beneath and dull, the margins usually slightly revolute, the lateral veins nearly obsolete; peduncles slender, axillary and terminal, solitary or geminate, 1–3 cm. long, glabrous, the inflorescence laxly paniculate, 1–4 cm. broad, with few or rather numerous flowers, the branches slender, divaricate, glabrous or sparsely puberulent, the flowers sessile or subsessile, the bractlets oblong or ovate, 1 mm. long or less, glabrate; staminate perianth campanulate, 3–3.5 mm. long, glabrous or sparsely puberulent, the limb obtusely 5-dentate; stamens usually 6, less than twice as long as the perianth; pistillate perianth ellipsoid-oblong, 3–3.5 mm. long, glabrous, slightly constricted below the apex, 5-dentate, the teeth erect, acutish; fruit obovoid or globose-obovoid, 5–6 mm. long, red.

TYPE LOCALITY: Bahamas.

DISTRIBUTION: In thickets, near the coast, peninsular Florida and the adjacent keys; Bahamas.

ILLUSTRATIONS: Britton, N. Am. Trees f. 336, 337; Sarg. Man. f. 251.

8. *Torrubia Bracei* Britton, Bull. Torrey Club 31: 614. 1904.

A slender tree, 5 meters high or less, the branches stout, reddish-brown or gray, striate, the branchlets slender, yellowish, glabrous except about the nodes, there ferrugino-puberulent,



the internodes short; leaves opposite, subequal, the petioles slender, 3–8 mm. long, glabrous, the blades narrowly obovate-oblong to obovate, broadest above the middle, 3–5.5 cm. long, 1–2 cm. wide, cuneately attenuate or long-attenuate at the base, rounded or obtuse at the apex, often retuse, deep-green, subconcolorous, dull, glabrous, the margins revolute, the lateral veins obsolete or nearly so; peduncles slender, 1–1.5 cm. long, glabrous, the inflorescence corymbose, glabrous, few-flowered, 1.5 cm. broad, the flowers sessile, the bractlets oblong, 1 mm. long, glabrous; pistillate perianth narrowly ellipsoid-oblong, 3 mm. long, slightly constricted below the apex, obtusely 5-denticulate; style slightly exerted; fruit oblong-obovoid, 7–8 mm. long, 2 mm. in diameter, claret-red.

TYPE LOCALITY: Coastal coppice, Ft. Montague, New Providence, Bahamas.

DISTRIBUTION: In coastal thickets, Bahamas.

9. *Torrubia cuspidata* (Heimerl) Standley, Contr. U. S. Nat. Herb.  
18: 100. 1916.

*Pisonia cuspidata* Heimerl, Bot. Jahrb. 21: 628. 1896.

Tree, 6 meters high, the branches divaricate, yellowish-brown, rugulose, glabrous, the branchlets rufo-puberulent, leafy at the apex; petioles 1–2.5 cm. long; leaf-blades lance-elliptic or ovate, broadest below the middle, 11.5–15 cm. long, 4.8–7 cm. wide, subdecurent at the base, gradually or abruptly acuminate or attenuate at the apex, usually subcuspidate, with an obtuse or acute acumen, densely ferrugino-puberulent when young, glabrate and dull in age, thin-coriaceous, the lateral veins prominent, 6–9 on each side, arcuate, laxly anastomosing near the plane margins; peduncles stout, 5–7 cm. long, terminal, the inflorescence cymose, many-flowered, dense, the branches rufo-puberulent, ascending, the ultimate cymules 3–many-flowered, the flowers sessile or rarely on pedicels 1–3 mm. long, the bractlets ovate-triangular, 1 mm. long, puberulent; staminate perianth obconic, 3–4 mm. long, rufo-puberulent, the limb shortly 5-dentate, the teeth triangular, obtuse; stamens 7, 6–8 mm. long; pistillate perianth oblong-ovoid, 2.5–3 mm. long; fruit not known.

TYPE LOCALITY: Along the Caroni River, Trinidad.

DISTRIBUTION: Grenada and Trinidad.

10. *Torrubia potosina* Standley, Contr. U. S. Nat. Herb. 18: 99.  
1916.

Branches slender, grayish, striolate, the branchlets slender, sparsely ferrugino-puberulent when young, the internodes 1.5–7 cm. long; leaves opposite, subequal or unequal, the petioles slender, 4–6 mm. long, sparsely ferrugino-puberulent, the blades oval or oblong-oval, rarely orbicular-oval, 5–10.5, or rarely only 3.5, cm. long, 2.2–5 cm. wide, rounded or acutish at the base, acute or usually cuspidately acute or acuminate at the apex, thin, glabrous, concolorous, slightly lustrous on the upper surface, the lateral veins prominent, divergent, nearly straight, about 8 on each side, laxly anastomosing near the margins, the secondary veins laxly and inconspicuously reticulate; pistillate peduncles terminal and axillary, 2.5–7.5 cm. long, very slender, sparsely puberulent or glabrous, the inflorescence few-flowered, cymose paniculate, 1.5–3.5 cm. long, the branches opposite or dichotomous, divergent, sparsely ferrugino-puberulent, the flowers solitary or in cymules of 3, sessile or on pedicels 4 mm. long or shorter, the bractlets acute, about 0.5 mm. long, puberulent, the perianth elliptic-oblong, 2.5–3 mm. long, slightly constricted in the throat, sparsely puberulent, the teeth triangular, acute, erect; fruit oval, 7 mm. long, 4.5 mm. in diameter; utricle finely striate; seed elliptic-oblong, 6 mm. long, 2.5–3 mm. in diameter, brown.

TYPE LOCALITY: Near Rascón, San Luis Potosí.

DISTRIBUTION: Known only from the type locality.

11. *Torrubia costaricana* Standley, Contr. U. S. Nat. Herb. 13: 385.  
1911.

A small tree, the branches slender, gray, striolate, glabrous, the slender branchlets ferrugino-puberulent when young but soon glabrate, the internodes 0.7–4.5 cm. long; leaves opposite, subequal, the petioles slender, 5–10 mm. long, sparsely puberulent or glabrous, the blades



elliptic, broadest at the middle, 7–11 cm. long, 1.8–3.4 cm. wide, attenuate at the base, rather abruptly long-attenuate or subcaudate at the apex, with an obtuse acumen, thin, deep-green, concolorous, glabrous, the margins plane, the lateral veins numerous, very slender, straight, the veinlets finely reticulate; staminate peduncles terminal and axillary, 2–3 cm. long, slender, sparsely ferrugino-puberulent, the inflorescence cymose, 2–3.5 cm. broad, the primary branches verticillate, short, densely puberulent, the bracts minute or wanting, the flowers mostly solitary, on stout pedicels 1 mm. long or less, the bractlets ovate-oblong, acutish, 0.5 mm. long, the perianth broadly funnelform, 2–2.5 mm. long, puberulent, white, the teeth minute, broad, obtuse; stamens 5, twice as long as the perianth; pistillate flowers and fruit not known.

TYPE LOCALITY: In forests about Nicoya, Costa Rica.

DISTRIBUTION: Known only from the type locality.

12. *Torrubia linearibracteata* (Heimerl) Standley, Contr. U. S. Nat. Herb. 18: 100. 1916.

*Pisonia linearibracteata* Heimerl, Repert. Sp. Nov. 12: 221. 1913.

Branches spreading, slender, straight or flexuous, grayish or grayish-brown, densely striolate, the internodes 0.3–3.2 cm. long, glabrate, the branchlets rufo-puberulent; leaves opposite or, at the apices of the branches, verticillate, equal or unequal, the petioles 4–10 mm. long, 1 mm. thick, glabrous, the blades rhombic-elliptic to broadly lance-elliptic, rarely obovate or oblanceolate-elliptic, 7.5 cm. long and 4.3 cm. wide or smaller, usually widest at the middle, usually equally and shortly acuminate or attenuate at both ends, the apex subobtuse, chartaceous, concolorous, dull, glabrous, the margins slightly revolute, the lateral nerves 5–8 on each side, slender, nearly straight, the veinlets few and laxly branched; staminate peduncles 3.2–6.4 cm. long, stout, glabrous or sparsely hirtellous, the inflorescence corymbose-paniculate, 3.5–6.5 cm. broad, many-flowered, lax, the branches rufo-puberulent, the bracts linear, 1.5–3.5 mm. long, the flowers mostly solitary, on pedicels 1–2.5 mm. long, the bractlets linear to linear-lanceolate, acutish, 1–1.5 mm. long, the perianth funnelform, 4–4.5 mm. long, rufo-puberulent, the limb 3 mm. broad; stamens 7 or 8, 5–7 mm. long; pistillate flowers and fruit unknown.

TYPE LOCALITY: In forest, Chichen Itzá, Yucatán.

DISTRIBUTION: Known only from the type locality.

13. *Torrubia Dussii* Standley, Contr. U. S. Nat. Herb. 18: 99. 1916.

*Pisonia obtusata* Heimerl, Bot. Jahrb. 21: 624, in part. 1896. Not *P. obtusata* Jacq. 1798.

Tree of medium size, the branches stout, rugose, sordid-grayish, the branchlets stout, glabrous except at the nodes, there puberulent, the internodes short; leaves opposite, unequal, the petioles rather stout, 4–8 mm. long, glabrous, the blades oval or oval-oblong, 8–10 cm. long, 4–6 cm. wide, rounded or obtuse at the base, abruptly acute or cuspidately short-acuminate at the apex, rarely acute, with a usually obtuse acumen, thin, concolorous, lustrous above, dull beneath, glabrous, the margins plane, the lateral veins slender, straight, 6–12 on each side, the veinlets nearly obsolete, laxly and sparsely reticulate; peduncles stout, 3.5–4.5 cm. long, glabrous, the inflorescence cymose, 6–8 cm. broad, many-flowered, glabrous, the branches stout, the flowers sessile, glomerate, the bractlets oblong or deltoid-oblong, acutish, 1 mm. long or shorter, glabrous; staminate perianth funnelform-campanulate, 6–7 mm. long, glabrous, the limb obscurely dentate; stamens 6, half longer than the perianth; fruit ellipsoid, 11 mm. long, 3 mm. in diameter.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Guadeloupe and Martinique.

14. *Torrubia coriifolia* (Heimerl) Standley, Contr. U. S. Nat. Herb. 18: 100. 1916.

*Pisonia coriifolia* Heimerl, Symb. Ant. 7: 213. 1912.

Small tree, the branches grayish, rugulose, glabrous, the branchlets ferrugino-puberulent; leaves opposite, the petioles stout, 5–12 mm. long, glabrous, the blades broadly obovate or



oval-obovate, 8.7 cm. long and 5.6 cm. broad or smaller, broadest above the middle, narrowed or attenuate at the base, rounded at the apex and cuspidate-acuminate, coriaceous, subconcolorous, lustrous above and glabrous, dull beneath and at first sparsely rufo-hirtellous but soon glabrate, the margins slightly revolute, the lateral veins prominent, numerous, usually 10 or more; staminate peduncles slender, erect, 1.4–3.3 cm. long, the inflorescence subcorymbose, 2 cm. broad or less, rather few-flowered, dense, the branches ferrugino-puberulent, ascending, the ultimate cymules 2–5-flowered, the flowers subsessile or on pedicels 1 mm. long or shorter, the bractlets ovate, subobtuse, 1 mm. long, the perianth funnelform, 3.5–4 mm. long, rufo-puberulent, the limb obscurely 5-lobed, 3 mm. broad; stamens commonly 9, rarely 8, 5.5 mm. long or less; pistillate flowers and fruit unknown.

TYPE LOCALITY: Grenada.

DISTRIBUTION: Grenada.

### 15. *Torrubia panamensis* Standley, sp. nov.

*Pisonia Pacurero* Seem. Bot. Voy. Herald 192. 1854. Not *P. Pacurero* H. B. K. 1817.

Branches slender, grayish-brown, the branchlets slender, densely ferrugino-puberulent, even in age, the internodes short; leaves opposite, very unequal, the petioles slender, 3–16 mm. long, densely ferrugino-puberulent, the blades oblong-obovate to oval-obovate, broadest above the middle, 5–8.5 cm. long, 2–3.8 cm. wide, cuneate-attenuate at the base, abruptly acute or cuspidate-acuminate at the apex, rarely obtuse or rounded, some of the blades often much reduced and only 5–10 mm. long, thin, deep-green, concolorous, glabrous, or sparsely puberulent beneath along the veins, the margins plane or obscurely revolute, the lateral veins evident, slightly arcuate, laxly anastomosing near the margins, the veinlets usually evident and finely reticulate; peduncles terminal, very slender, flexuous, sometimes pendulous, 2–4.5 cm. long, sparsely puberulent, the inflorescence loosely corymbose, 2–3 cm. broad, few-flowered, the pistillate flowers solitary, on slender, densely puberulent pedicels 1.5–3 mm. long, or a few of the flowers sessile, the bractlets linear, 1 mm. long; staminate perianth campanulate, 3 mm. long, puberulent; stamens 6, long-exserted; pistillate perianth ellipsoid-oblong, 3 mm. long, constricted below the apex, ferrugino-puberulent.

Type collected on Taboga Island, Gulf of Panama, in May, 1911, *H. Pittier* 3602 (U. S. Nat. Herb. no. 678658).

DISTRIBUTION: Panama.

ILLUSTRATION: Seem. Bot. Voy. Herald *pl.* 34.

### 16. *Torrubia fragrans* (Dum.-Cours.) Standley, Contr. U. S. Nat.

Herb. 18: 100. 1916.

*Pisonia obtusata* Sw. Fl. Ind. Occ. 1960. 1806. Not *P. obtusata* Jacq. 1798.

*Pisonia fragrans* Dum.-Cours. Bot. Cult. ed. 2. 7: 114. 1814.

*Pisonia nigricans* Choisy, in DC. Prodr. 13<sup>2</sup>: 442, in part. 1849. Not *P. nigricans* Sw. 1800.

*Pisonia inermis* Griseb. Fl. Brit. W. Ind. 71. 1859, in part. Not *P. inermis* Jacq. 1763.

*Torrubia inermis* Britton, Bull. Torrey Club 31: 614, in part. 1904.

*Pisonia fragrans oblanceolata* Heimerl, Symb. Ant. 7: 213. 1912.

Tree, 15 meters high or less, the branches ascending, grayish or brownish, stout, the branchlets grayish- or rufo-puberulent, the internodes usually short; leaves opposite, often very unequal and irregular, the petioles 3–10 mm. long, the blades rhombic-oval, rhombic-obovate, obovate-oblong, obovate, or oblanceolate, the smallest rarely suborbicular, usually broadest above the middle, 3–9 cm. long, 2.5–5 cm. wide, attenuate to acute at the base or rarely obtuse, rather abruptly acute or acuminate at the apex, or sometimes rounded or even emarginate, very rarely bilobate, thin, glabrous, concolorous, often lustrous above, dull beneath, the margins plane, the lateral veins evident, usually numerous and approximate, slightly arcuate, laxly anastomosing near the margins, the veinlets often finely reticulate beneath; peduncles mostly terminal, stout, 2–4.5 cm. long, sparsely puberulent or glabrate, the inflorescence cymose, 2–6 cm. broad, many-flowered, the branches stout, spreading, puberulent or finally glabrate, the flowers sessile or on pedicels 1–2 mm. long, in glomerules of 3–5, the bractlets lance-ovate, 1 mm. long or less, puberulent; staminate perianth tubular-funnelform, 3–4 mm. long, puberulent, obtusely 5-denticulate; stamens 6–8, less than twice



as long as the perianth; pistillate perianth elliptic-oblong, 3 mm. long, slightly constricted below the mouth, obtusely 5-dentate, puberulent; fruit oblong-ellipsoid, 7–11 mm. long, 3–4 mm. in diameter.

TYPE LOCALITY: Described from cultivated specimens.

DISTRIBUTION: General in the West Indies except Jamaica; also in Colombia and Venezuela.

17. *Torrubia Harrisiana* (Heimerl) Standley, Contr. U. S. Nat. Herb. 18: 100. 1916.

*Pisonia obtusata* Heimerl, Bot. Jahrb. 21: 624, in part. 1896. Not *P. obtusata* Jacq. 1798.

*Pisonia Harrisiana* Heimerl, Symb. Ant. 7: 214. 1912.

Tree, 6–15 meters high, the branches stout, gray or brownish, rugulose, the branchlets stout, yellowish-gray, sparsely rufo-puberulent but soon glabrate; leaves opposite, subequal, the petioles 0.5–2 cm. long, slender, puberulent or glabrate, the blades oval, oval-obovate, or obovate, 4.5–11.5 cm. long, 2.2–6 cm. wide, broadest at or sometimes above the middle, obtuse to attenuate at the base and usually short-decurrent, rather abruptly acute or acutish or sometimes obtuse at the apex, thin, concolorous, lustrous above, sparsely puberulent when young but soon glabrate, the margins plane or slightly revolute, the lateral veins evident, slender, distant, 6–9 on each side, the veinlets obsolete or nearly so; peduncles stout, 2.5–7 cm. long, puberulent or glabrate, the inflorescence loosely corymbose, 4–7 cm. broad, many-flowered, the branches slender, ascending or spreading, densely grayish- or brownish-puberulent, the flowers sessile or subsessile, glomerate, the bractlets ovate or lanceolate, acutish, 1 mm. long, puberulent; staminate perianth tubular-funnelform, 3.5–4 mm. long, densely puberulent, shallowly and obtusely 5-dentate; stamens 6–8, less than twice as long as the perianth; pistillate perianth subcampanulate, 2.5–3 mm. long, the limb 1.5 mm. broad, spreading, 5-dentate, the teeth acutish, densely puberulent; fruit ellipsoid, 8–9 mm. long, 4–6 mm. thick, dark-red, the utricle 5–6 mm. long, striate.

TYPE LOCALITY: Potsdam Woodland, Santa Cruz Mountains, Jamaica, at an altitude of 860 meters.

DISTRIBUTION: Jamaica.

4. *PISONIA* L. Sp. Pl. 1026. 1753.

*Pallavia* Vell. Fl. Flum. 151. 1827.

Trees or shrubs, erect or subscandent, glabrous or pubescent, often armed with spines. Leaves mostly opposite, usually petiolate, the blades entire. Flowers dioecious, small, reddish- or yellowish-green, arranged in sessile or pedunculate cymes, exinvolucrate, 2–3-bracteolate. Staminate perianth obconic-campanulate, the limb 5-dentate, the teeth short, induplicate-valvate; stamens 6–8, exserted, the filaments unequal, filiform, short-connate at the base, the anthers didymous. Pistillate perianth tubular, the limb 5-dentate. Ovary elongate-ovoid, sessile, attenuate to a slender short-exserted style; stigma penicillate. Anthocarp coriaceous, clavate or oblong, terete and costate or 5-angulate, the angles or costae furnished with one or more rows of viscid stipitate glands; utricle elongate, coriaceous or membranaceous. Seed with a hyaline testa adherent to the pericarp; embryo straight, the cotyledons broad, thin, enclosing the scanty endosperm, the radicle short, inferior.

Type species, *Pisonia aculeata* L.

Plants armed with spines.

Mature fruit 5–10 mm. in diameter, the glands along the angles in 2 or more rows.

Fruit 5–6.5 mm. in diameter; spines numerous, stout, recurved; leaves glabrous.

Fruit 7–10 mm. in diameter; spines few, or wanting on the ultimate branches, usually straight; leaves puberulent or short-villous along the costa beneath.

Mature fruit 3–4 mm. in diameter, the glands along the angles uniseriate or nearly so.

Staminate peduncles mostly fasciculate, the inflorescence with 10 or fewer flowers; spines straight.

Staminate peduncles solitary, the inflorescence many-flowered.

Staminate flowers yellowish-green, in loose open cymes 2.5–6 cm. broad.

1. *P. Helleri*.

2. *P. macranthocarpa*.

3. *P. fasciculata*.

4. *P. aculeata*.



- Staminate flowers dark-red, in compact head-like cymes 1-2.2 cm. broad.
- Leaf-blades acute or acutish, obovate or oblong-obovate, nearly glabrous; spines straight. 5. *P. flavescens*.
- Leaf-blades rounded or obtuse at the apex, orbicular or rounded-obovate, densely pubescent on both surfaces; spines usually recurved. 6. *P. capitata*.
- Plants unarmed.
- Leaf-blades herbaceous, acute to acuminate at the base; staminate flowers in a head-like cyme. 7. *P. Donnell-Smithii*.
- Leaf-blades coriaceous, obtuse to subcordate at the base; staminate inflorescence not head-like.
- Petioles 2-9 mm. long. 8. *P. rotundata*.
- Petioles 11-30 mm. long.
- Leaf-blades usually 2.2-6.5 cm. broad, obtuse or rounded at the base, pubescent beneath; fruit 5-angled. 9. *P. albida*.
- Leaf-blades mostly 5-9 cm. broad, usually subcordate at base, glabrous or nearly so; fruit terete, 10-costate. 10. *P. subcordata*.

### 1. *Pisonia Helleri* Standley, sp. nov.

Branches stout, dark reddish-brown, with few lenticels, armed with numerous stout recurved spines 4-10 mm. long, the branchlets glabrous or sparsely puberulent; petioles slender, 0.4-3.5 cm. long, glabrous; leaf-blades oval-elliptic, oblong-elliptic, ovate-oblong, or oval, 3.5-8.5 cm. long, 1.5-4.5 cm. wide, acute to attenuate at the base or rarely rounded, gradually or abruptly acute to attenuate at the apex, thick and succulent, deep-green, glabrous, the margins plane, the lateral veins usually nearly obsolete; peduncles of the staminate inflorescence 1-2.5 cm. long, stout, puberulent or short-villous, the cymes densely or loosely flowered, 2-4 cm. broad, the flowers yellowish-green, numerous, on pedicels 0.5-2 mm. long, the bractlets ovate or oblong, 1 mm. long, obtuse, densely puberulent, the perianth broadly campanulate, 2.5-3 mm. long, densely puberulent, the lobes deltoid, acutish; stamens 6 or 7, twice as long as the perianth; peduncles of the pistillate inflorescence 2-3 cm. long, slightly elongate in age, the cymes at first dense and only 1.5-2 cm. broad, in fruit 8-12 cm. broad, the pedicels at anthesis 0.5-2 mm. long, in age 1-3 cm. long, the perianth 2 mm. long, the tube short and stout, the limb ascending or spreading, the lobes broad, obtuse; fruit clavate or clavate-oblong, 10-14 mm. long, 5-6.5 mm. in diameter, rounded or slightly depressed at the apex, woody, 5-angled, the angles furnished with a row of low pluriserial glands, the faces densely puberulent; seed cylindric, acute at the base, about 1 cm. long and 2-3 mm. in diameter, dark-brown, striate.

Type collected two miles west of Bayamon, Porto Rico, April 29, 1899, Mr. & Mrs. A. A. Heller 1245 (U. S. Nat. Herb. no. 426204).

DISTRIBUTION: Porto Rico, Jamaica, Hispaniola, Martinique, Guadeloupe, and Antigua.

### 2. *Pisonia macranthocarpa* Donn. Smith, Bot. Gaz. 20: 293. 1895.

*Pisonia nigricans* Griseb. Fl. Brit. W. Ind. 70, in part. 1859. Not *P. nigricans* Sw. 1800.

*Pisonia aculeata macranthocarpa* Donn. Smith, Bot. Gaz. 16: 198. 1891.

*Pisonia aculeata pedicellaris* Griseb.; Heimerl, Bot. Jahrb. 21: 633. 1896.

Shrub or small tree, the branches stout, dark reddish-brown, with numerous conspicuous lenticels, the branchlets stout, puberulent when young but soon glabrate; spines few, often wanting on the ultimate branches, usually straight, stout, 5-8 mm. long; petioles stout or slender, 0.5-2.5 cm. long; leaf-blades elliptic to broadly oval or rarely broadly obovate, often irregular in outline, acute to attenuate at the base, acute to attenuate at the apex, sometimes abruptly so, or rarely obtuse or rounded, coriaceous, deep-green, concolorous, glabrous on the upper surface, puberulent or short-villous beneath along the costa, or sometimes glabrate in age, the margins plane, the lateral veins evident, ascending at an angle of 45-60°; peduncles of the staminate inflorescence 1.5-3 cm. long, viscid-puberulent or hirtellous, the cymes dense, many-flowered, 2-3.5 cm. broad, the flowers short-pedicellate, the bractlets ovate, acute, 1 mm. long, puberulent, the perianth broadly campanulate, 3-4 mm. broad, yellowish-green, puberulent, the teeth short, deltoid, acute; stamens usually 8, twice as long as the perianth; peduncles of the pistillate inflorescence at anthesis 1-2 cm. long, 4-8 cm. long in fruit, the cymes many-flowered, divaricately branched, at anthesis 2-3 cm. broad, in age 5-12 cm. broad, the branches puberulent, the bractlets oblong or linear, about 1 mm. long, the pedicels at anthesis 1-2 mm.



long, in age 2–5 cm. long; pistillate perianth 3 mm. long, funnelform, the teeth short and broad, obtuse or acute, densely puberulent; fruit woody, oblong in outline or broadly clavate, 1–2.1 cm. long, 7–10 mm. thick, 5-angled, truncate or depressed at the apex, acute at the base, the faces densely tomentulose with yellowish or brownish hairs, each angle furnished with a row of low multiseriate glands; seed ellipsoid, about 9 mm. long and 3 mm. in diameter.

TYPE LOCALITY: Escuintla, Guatemala, at an altitude of 330 meters.

DISTRIBUTION: Cuba; Chiapas to Nicaragua and Costa Rica; also in Venezuela.

### 3. *Pisonia fasciculata* Standley, Contr. U. S. Nat. Herb. 13: 388. 1911.

Branches reddish-brown or gray, smooth, the branchlets stout, spinose, sparsely puberulent when young, glabrate in age; spines few, stout, straight, 3–4 mm. long; petioles slender, 4–5 mm. long, puberulent; leaf-blades oblong-elliptic to oval-elliptic, 3.5–4 cm. long, 1.3–2 cm. wide, acute at the base, acute or abruptly acute at the apex, the apex usually obtuse, subcoriaceous, bright-green, concolorous, sparsely puberulent beneath along the midvein, at least when young, elsewhere glabrous, the margins plane, the lateral veins nearly obsolete; peduncles of the staminate inflorescence usually in clusters of 2–5, 10–12 mm. long, viscid-villous with very short ferruginous hairs, the cymes subcapitate, about 1 cm. in diameter, 5–10-flowered, the flowers short-pedicellate, the pedicels densely and shortly ferrugino-villous; staminate perianth campanulate, 2–3 mm. long, glandular-puberulent; stamens 6, nearly twice as long as the perianth; pistillate flowers and fruit not known.

TYPE LOCALITY: Nicaragua.

DISTRIBUTION: Guatemala and Nicaragua.

### 4. *Pisonia aculeata* L. Sp. Pl. 1026. 1753.

*Pisonia villosa* Poir. in Lam. Encyc. 5: 347. 1804.

*Pisonia Sieberi* Schlecht. Linnaea 22: 876. 1822.

*Pisonia loranthoides* H. B. K. Nov. Gen. & Sp. 7: 197. 1825.

*Pallavia aculeata* Vell. Fl. Flum. 151. 1825.

*Pisonia monotaxadenia* Wright; Sauv. Anal. Acad. Ci. Habana 7: 199. 1870.

*Pisonia tomentosa* Vahl; Heimerl, Bot. Jahrb. 21: 631, as synonym. 1896.

*Pisonia grandifolia* Standley, Contr. U. S. Nat. Herb. 13: 391. 1911. Not *P. grandifolia* Warb. 1891.

Densely branched shrub, often with a thick trunk, the branches stout, elongate, drooping or subscandent, usually armed with numerous stout, recurved, very rarely straight spines 6–20 mm. long, the bark of older stems reddish-brown, with few or no lenticels, the branchlets densely puberulent or short-villous, rarely glabrate; petioles slender or stout, 0.5–3.5 cm. long; leaf-blades very variable in outline, commonly elliptic-oval, but often ovate-oblong, subrhombic, obovate, oval, obovate-orbicular, or even orbicular, 2.5–15 cm. long, 1.5–6 cm. wide, usually broadly or narrowly cuneate at the base but sometimes rounded or even subcordate, acute or acutish at the apex or abruptly acute or acuminate or even rounded or emarginate, thick and succulent, glabrous and lustrous on the upper surface or puberulent, glabrate beneath or puberulent or short-villous, always with at least sparse pubescence along the costa, the margins plane, the lateral veins evident or obsolete; peduncles stout, 0.8–5 cm. long, or the pistillate ones in fruit still longer; inflorescence loosely or densely cymose, many-flowered, at anthesis 2–6 cm. broad, the pistillate cymes in fruit often 10 cm. broad; pedicels at anthesis short, puberulent, short-villous, or hirtellous, the pubescence usually viscid, the pistillate pedicels in fruit 1.6 cm. long or less; staminate perianth broadly campanulate, 2–4 mm. long, densely puberulent or tomentulose, yellowish-green, the lobes broad, acutish; stamens usually 6, twice as long as the perianth; pistillate perianth tubular, 2–3 mm. long, puberulent; fruit clavate, 9–12 mm. long, 3–4 mm. in diameter, rounded at the apex, narrowed at the base, thinly coriaceous, 5-angled, each angle furnished with a row of low uniseriate or obscurely biseriate glands, the faces glabrate or puberulent; seed cylindric, 7–10 mm. long, 1.5 mm. in diameter, brown.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: On sea beaches or hillsides, Florida keys and the West Indies; Tamaulipas to Sinaloa and Panama; also in tropical South America and Asia, and on many of the oceanic and continental islands.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 861; Vell. Fl. Flum. 4: pl. 12; Sloane, Hist. Jam. pl. 167, f. 3, 4; Plum. Ic. pl. 227, f. 1; Gaertn. Fruct. pl. 76; Wight, Ic. pl. 1763, 1764; Nutt. Sylva 3: pl. 121; Fawc. & Rendle, Fl. Jam. 3: f. 51.



5. **Pisonia flavescens** Standley, Contr. U. S. Nat. Herb. 13: 389.  
1911.

Branches slender, dark-gray, smooth, the branchlets brown or grayish, puberulent; spines stout, straight, 6–7 mm. long; petioles slender, 1–2 cm. long; leaf-blades obovate or obovate-oblong, 4–6.5 cm. long, 1.5–3 cm. wide, very acute or attenuate at the base, acute or acuminate at the apex, the acumen usually obtuse, subcoriaceous, yellowish-green, concolorous, glabrate above, minutely puberulent beneath, the margins plane, the lateral veins evident beneath, arcuate-ascending at an angle of 45–60°; peduncles solitary, 1 cm. long or usually shorter; staminate inflorescence capitate-cymose, many-flowered, 1 cm. broad or less, the flowers very short-pedicellate, the pedicels puberulent; staminate perianth broadly campanulate, 2.5 mm. long and usually broader, puberulent, deep-red; stamens usually 6, nearly twice as long as the perianth; fruit clavate, 10 mm. long, 3–4 mm. in diameter, 5-angled, glabrate, each angle beset with a row of short uniseriate glands.

TYPE LOCALITY: San José del Cabo, Lower California.

DISTRIBUTION: Vicinity of the type locality.

6. **Pisonia capitata** (S. Wats.) Standley, Contr. U. S. Nat. Herb.  
13: 388. 1911.

*Cryptocarpus ? capitatus* S. Wats. Proc. Am. Acad. 24: 71. 1889.

A densely branched shrub or small tree, 5 meters high or less, branched to the ground or often with a distinct trunk, the branches spreading or often weak and clambering, armed with numerous stout, recurved or rarely straight spines 7–14 mm. long; branches stout, terete, gray or greenish-gray, sometimes reddish-brown, the branchlets densely short-villous; petioles slender or stout, 0.6–3 cm. long; leaf-blades orbicular or orbicular-obovate, 2–6 cm. long and nearly or quite as broad, rounded to broadly cuneate at the base, broadly rounded at the apex, or sometimes very shortly and abruptly acutish, thick and firm, dull, yellowish-green, densely and finely puberulent on the upper surface, densely puberulent or very short-villous beneath, the margins plane, the lateral veins often conspicuous beneath, divaricate or ascending; peduncles of the staminate inflorescence solitary, stout, 0.5–3 cm. long, the cymes subglobose, congested, densely many-flowered, 1–1.8 cm. in diameter, the flowers on very short, densely puberulent pedicels, the perianth broadly campanulate, 2–3 mm. long, densely and shortly viscid-villous, deep-red, the lobes obtuse; stamens 6, twice as long as the perianth; pistillate peduncles 0.5–2 cm. long at anthesis, 4 cm. long or less in fruit, the cymes at anthesis subglobose, densely flowered, in age loosely branched, the branches divaricate or ascending, the pedicels at first 1–2 mm. long, in age 0.5–2 cm. long, the bractlets subulate-linear, 1 mm. long, the perianth tubular, 2–2.5 mm. long, densely puberulent, shallowly 5-dentate; fruit clavate or prismatic, 7–10 mm. long, 3–4 mm. in diameter, rounded at the apex, narrowed at the base, 5-angled, each angle furnished with a row of low uniseriate glands, the sides densely puberulent; seed cylindric, 6–8 mm. long, 1.5 mm. in diameter, dark-brown.

TYPE LOCALITY: Near Guaymas, Sonora.

DISTRIBUTION: In sandy soil, often along watercourses, southern Sonora to Tepic.

ILLUSTRATION: Contr. U. S. Nat. Herb. 13: pl. 75, B.

7. **Pisonia Donnell-Smithii** Heimerl; Standley, Contr. U. S. Nat.  
Herb. 13: 387. 1911.

Branches stout, unarmed, grayish, shortly appressed-pilose, glabrate in age, densely leafy; leaves usually crowded on the short lateral branches, very unequal, the petioles 4–8 mm. long, the blades obovate, obovate-oblong, or elliptic-oblong, 3–5.5 cm. long, 1.2–2.8 cm. wide, acute or attenuate at the base, narrowed to the obtuse apex, bright-green, concolorous, herbaceous, sparsely puberulent on the upper surface or glabrate, short-villous beneath along the costa, the margins plane, the lateral veins nearly obsolete; staminate peduncles solitary, 2.2–3 cm. long, the inflorescence capitate-corymbose, 2 cm. broad or less, the flowers on pedicels 1 mm. long or shorter; bractlets 1–1.5 mm. long, oval, oblong, or obovate, rounded at the apex,



green, glabrous or nearly so; staminate perianth narrowly campanulate, 5 mm. long, minutely puberulent, 5-dentate, the teeth obtuse; pistillate flowers and fruit not known.

TYPE LOCALITY: Los Verdes, Department of Amatitlán, Guatemala, at an altitude of 1050 meters.

DISTRIBUTION: Known only from the type locality.

### 8. *Pisonia rotundata* Griseb. Cat. Pl. Cub. 283. 1866.

*Pisonia subcordata rotundata* Heimerl, Bot. Jahrb. 21: 630. 1896.

A spreading shrub, 1–1.5 meters high, or a small tree, 6 meters high or less, the branches stout, gray or brown, the branchlets stout, densely ferrugino-puberulent or tomentulose when young, glabrate in age, densely leafy, the internodes very short; petioles stout, 2–9 mm. long; leaf-blades broadly obovate-oval, oval-oblong, or rounded-oval, 2–6 cm. long, 1.5–4.5 cm. wide, rounded or obtuse at the base, broadly rounded and usually shallowly emarginate at the apex, coriaceous, grayish-green above and glabrous or sparsely puberulent, slightly paler beneath and puberulent or hirtellous, usually densely so when young but sometimes glabrate in age, the margins revolute, the lateral veins prominent beneath, 5–9 on each side, divergent at an angle of about 60°; peduncles stout, 1.5–3.5 cm. long, densely puberulent or ferrugino-hirtellous, or rarely glabrate; staminate cymes 2–3.5 cm. broad, dense, the branches ascending, the flowers short-pedicellate or sessile, the bractlets minute, the perianth campanulate, 3 mm. long, sparsely or densely puberulent; stamens usually 8, nearly twice as long as the perianth; pistillate cymes 4–6 cm. broad, loosely divaricate-branched, the flowers on pedicels 2–9 mm. long, the bractlets linear, 1 mm. long or shorter, puberulent, the perianth tubular, 3.5–4 mm. long, densely puberulent; fruit clavate, about 8 mm. long, 5-angled, rounded at the apex, densely puberulent, the angles each bearing a row of low uniseriate glands.

TYPE LOCALITY: Near Hanabana, Cuba.

DISTRIBUTION: Florida keys; Bahamas, Cuba, and the Isle of Pines.

### 9. *Pisonia albida* (Heimerl) Britton.

*Pisonia subcordata typica albida* Heimerl, Bot. Jahrb. 21: 630. 1896.

*Pisonia subcordata typica gigantophylla* Heimerl, Bot. Jahrb. 21: 630. 1896.

*Pisonia subcordata albida* Heimerl, Symb. Ant. 4: 226. 1905.

Branches stout, gray, the branchlets grayish-puberulent when young but soon glabrate, densely leafy; petioles 1.1–2 cm. long, stout; leaf-blades oblong, oval, or rounded-oval, 4.5–11 cm. long, 2.5–6.5 cm. wide (rarely up to 26 cm. long and 18 cm. wide on young shoots), rounded or obtuse at the base, broadly rounded at the apex or rarely obtuse, subcoriaceous, grayish-green above and glabrous or nearly so, paler beneath and cinereo-tomentulose, or glabrate in age, the margins plane, sometimes undulate, the lateral veins prominent beneath, ascending at an angle of 45–60°, nearly straight, the veinlets finely reticulate; peduncles 1–3 cm. long; staminate cymes 2–3.5 cm. broad, dense or rather open, the branches grayish-puberulent, the flowers short-pedicellate, the bractlets minute, the perianth campanulate, 3 mm. long, puberulent, 5-dentate, the teeth short, obtuse; stamens usually 8, about twice as long as the perianth; pistillate cymes open, divaricate-branched, the pedicels 2–15 mm. long, the bractlets minute; fruit (immature) 6–7 mm. long, clavate, 5-angled, densely puberulent, the angles each bearing a row of short uniseriate glands above the middle.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: On dry limestone hillsides and in sandy coastal thickets, Porto Rico.

### 10. *Pisonia subcordata* Sw. Prodr. 60. 1788.

*Pisonia nigricans* West, Bidr. St. Croix 312. 1793. Not *P. nigricans* Sw. 1800.

*Pisonia subovata* Poir. in Lam. Encyc. 5: 347. 1804.

*Pisonia subcordata Swartziana* Heimerl, Bot. Jahrb. 21: 630. 1896.

Tree, 10–20 meters high, the branches stout, gray or brownish, the branchlets stout, ferrugino- or grayish-puberulent when young but soon glabrate, the internodes short; petioles slender or stout, 1–3 cm. long, glabrous or nearly so; leaf-blades suborbicular to broadly oval, 5.5–13.5 cm. long, 4.5–10.5 cm. wide, usually subcordate at the base but sometimes rounded, often unequal, usually broadly rounded at the apex but sometimes obtuse or shallowly emar-



ginate, deep-green, concolorous, glabrous, or sparsely puberulent beneath along the veins, the margins plane, the lateral veins prominent, arcuately divergent or ascending; peduncles stout, 1–3 cm. long, puberulent when young but soon glabrate; staminate inflorescence densely corymbose, 2–3 cm. broad, the flowers very shortly and stoutly pedicellate or sessile, green or greenish-yellow, the bractlets deltoid, 1 mm. long or shorter, the perianth campanulate, 3–4 mm. long, puberulent; stamens usually 8, nearly twice as long as the perianth; pistillate inflorescence loosely corymbose, 4.5–7 cm. broad, the flowers on pedicels 5 mm. long or shorter, the bractlets linear, 1–1.5 mm. long, the perianth 3 mm. long, cylindric; fruit cylindric or clavate, 10–13 mm. long, 1.5 mm. in diameter, 10-striate, bearing on the upper third 5 rows of low uniseriate glands.

TYPE LOCALITY: Antigua.

DISTRIBUTION: Porto Rico to Martinique.

ILLUSTRATION: E. & P. Nat. Pfl. 3<sup>ib</sup>: f. 7, S.

### 5. *PISONIELLA* (Heimerl) Standley, Contr. U. S. Nat. Herb. 13: 385. 1911.

*Pisonia* § *Pisoniella* Heimerl, in E. & P. Nat. Pfl. 3<sup>ib</sup>: 29. 1889.

Erect shrubs, more or less pubescent, dichotomously much branched. Leaves opposite, those of a pair subequal, petiolate, the blades broad, entire. Flowers perfect, in headlike, pedunculate, axillary and terminal umbels, pedicellate, each pedicel subtended by a minute bract; perianth tubular-campanulate, slightly constricted at the middle, the limb induplicate-valvate, shallowly 5-lobed, the lobes rounded or subtruncate, the tube obtusely 5-angulate. Stamens 6–11; filaments filiform, exserted, short-connate into a fleshy ring at the base; anthers didymous. Ovary oblong, attenuate to a filiform style; stigma capitate, papillose. Anthocarp oblong-clavate, slightly curved, coriaceous, obtuse at the apex, narrowed at the base, 5-costate, the faces smooth, the angles bearing numerous verrucose glands. Seed narrowly oblong, the embryo straight; cotyledons broad, enclosing the farinaceous endosperm; radicle short, descending.

Type species, *Boerhaavia arborescens* Lag. & Rodr.

### 1. *Pisoniella arborescens* (Lag. & Rodr.) Standley, Contr. U. S. Nat. Herb. 13: 385. 1911.

*Boerhaavia arborescens* Lag. & Rodr. Anal. Ci. Nat. 4: 257. 1801.

*Pisonia hirtella* H. B. K. Nov. Gen. & Sp. 2: 217. 1818.

*Pisonia mexicana* Willd. (Enum. Suppl. 20, hyponym. 1813); Link, Enum. Hort. Berol. 1: 354. 1821.

*Boerhaavia octandra* S. Wats. Proc. Am. Acad. 26: 145. 1891.

*Pisonia arborescens* Kuntze, Rev. Gen. 3<sup>2</sup>: 265. 1898.

Shrub 2 meters high or less, the branches ascending or spreading, slender, brownish or grayish, sparsely puberulent, sometimes short-villous at the nodes, soon glabrate; petioles slender, 3–10 mm. long; leaf-blades ovate-orbicular to rounded-oval or broadly ovate, 2.5–7 cm. long, 1.5–4 cm. wide, truncate or rounded at the base, obtuse to attenuate at the apex, usually rather abruptly so, thin, bright-green, slightly paler beneath, puberulent and short-villous, especially along the veins, ciliate, glabrate in age; peduncles 2–10 cm. long; heads of flowers dense, many-flowered, 12–15 mm. in diameter, the slender pedicels 1–2 mm. long, in age sometimes 6 mm. long; perianth 5–7 mm. long, greenish-white, viscid-puberulent; fruit about 1 cm. long, 1.5–2 mm. thick, dark-brown.

TYPE LOCALITY: Salvatierra, Guanajuato.

DISTRIBUTION: Jalisco to Veracruz and Oaxaca

II. **SALPIANTHEAE.** Plants herbaceous, or suffrutescent at the base, unarmed. Leaves alternate. Flowers perfect, usually racemose; perianth small, green, persistent, almost unchanged in fruit, of like consistency throughout. Anthocarp dry, eglandular. Embryo strongly curved.

## 6. SALPIANTHUS Humb. & Bonpl. Pl. Aequin. 1: 155. 1807.

*Boldoa* Lag. Gen. & Sp. Nov. 9. 1816.

*Cryptocarpus* H. B. K. Nov. Gen. & Sp. 2: 187. 1817.

Large herbs or sometimes shrubs (the roots sometimes tuberous ?), much branched, the branches pubescent and usually viscid. Leaves alternate, petiolate, the blades broad, entire. Flowers perfect, exinvolucrate, ebracteate, small, glomerate or racemose, forming terminal and axillary, paniculate cymes; perianth campanulate, urceolate, or tubular, green or reddish, scarcely accrescent in age and persistent, pubescent and glandular-viscid, the limb 4-dentate, the teeth valvate, short. Stamens 3 or 4, inserted on a small fleshy disk, shortly united at the base, or sometimes only on one side, opposite the perianth segments; filaments exserted, filiform, flexuous, unequal; anthers didymous, the cells globose. Ovary sessile, attenuate to a filiform style; stigma acute. Fruit utricular, subglobose, compressed, costate on one side, coriaceous. Seed with the testa adherent to the pericarp; embryo hippocrepiform, the cotyledons plane, enclosing the copious endosperm, the radicle elongate, descendent.

Type species, *Salpianthus arenarius* Humb. & Bonpl.

Perianth campanulate, little exceeding the fruit, green, 2.5–3 mm. long, bearing numerous uncinat hairs.

1. *S. purpurascens*.

Perianth tubular, several times as long as the fruit, reddish or whitish, 5–7 mm. long, without uncinat hairs.

Perianth 5 mm. long; branches of the inflorescence flexuous, almost equally dichotomous; racemes 2–5 cm. long; leaves sessile or nearly so.

2. *S. aequalis*.

Perianth 6–7 mm. long; branches of the inflorescence not flexuous, alternate; racemes 1–2 cm. long; leaves conspicuously petiolate.

Perianth densely villous, especially above, the teeth broadly triangular, connivent or incurved; stems short-villous above.

3. *S. arenarius*.

Perianth usually puberulent, or sparsely villous, the teeth triangular, erect or slightly spreading; stems puberulent.

4. *S. macrodontus*.

### 1. *Salpianthus purpurascens* (Cav.) H. & A. Bot. Beech. Voy. 308. 1837.

*Boldoa purpurascens* Cav.; Lag. Gen. & Sp. Nov. 10. 1816.

*Boldoa ovatifolia* Lag. Gen. & Sp. Nov. 10. 1816.

*Cryptocarpus globosus* H. B. K. Nov. Gen. & Sp. 2: 187. 1817.

*Boerhaavia rhomboidea* Humb.; Spreng. Jahrb. Gewächsk. 1<sup>3</sup>: 66. 1818.

*Boldoa paniculata* Mart. & Gal. Bull. Acad. Brux. 10<sup>1</sup>: 356. 1842.

*Chenopodium petiolare* Mart. & Gal. Bull. Acad. Brux. 10<sup>2</sup>: 345. 1843. Not *C. petiolare* H. B. K. 1817.

*Cryptocarpus rhomboideus* Moq. in DC. Prodr. 13<sup>2</sup>: 88. 1849.

Plants herbaceous, about a meter high, much branched, the branches slender, subangulate, green, sparsely puberulent or glabrate, those of the inflorescence viscid and bearing numerous short uncinat hairs; petioles 1–11 cm. long, slender, marginate above; leaf-blades broadly rhombic-ovate to ovate-deltoid, 4.5–22 cm. long, 3–18 cm. wide, acute to attenuate at the apex, usually abruptly so, the tip usually obtuse, abruptly acute or acuminate at the base and often long-decurrent, bright-green, finely scaberulous when young, glabrate in age; flowers sessile or subsessile, glomerate or in short dense racemes at the ends of the slender paniculate branches of the inflorescence; perianth subglobose or urceolate, terete, 2.5–3 mm. long, green, densely glandular-puberulent and bearing numerous short uncinat whitish hairs, 4-dentate, the teeth broadly ovate-triangular, obtuse; stamens 4, exserted, flexuous; fruit subglobose, slightly compressed, 1.5 mm. in diameter; seed black, lustrous, smooth.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Sinaloa and Jalisco to Veracruz and Guatemala; Cuba; also in northern South America.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 123.

### 2. *Salpianthus aequalis* Standley, Contr. U. S. Nat. Herb. 13: 392. 1911.

Shrub, or frutescent only at the base, 7–10 dm. high; branches stout, terete, reddish, cinereo-puberulent, the branches of the inflorescence rather stout, very flexuous, subequally dichotomous, densely grayish-villous with short hairs, not viscid; leaf-blades rhombic-ovate



to ovate-elliptic, 2.5–6.5 cm. long, 1–3 cm. wide, narrowed to the obtuse or acutish apex, acute to attenuate at the base, usually somewhat abruptly so, grayish-green, densely puberulent, the petioles very short, usually marginate to the base; flowers in dense racemes 2–5 cm. long, these forming a dense corymb 30 cm. broad; pedicels slender, 3–5 mm. long, densely short-villous; perianth greenish-white, 5 mm. long, 4-angulate, white-villous outside and bearing very numerous short gland-tipped hairs, slightly dilated above, shallowly 4-dentate, the teeth broadly triangular, short, obtuse or acutish, connivent; stamens 4, long-exserted, flexuous; fruit oval-ovoid, slightly compressed, 2.5 mm. long; seed dull-black, smooth.

TYPE LOCALITY: Monte de Charnaco, Michoacán or Guerrero, at an altitude of 810 meters.

DISTRIBUTION: Known only from the type locality.

### 3. *Salpianthus arenarius* Humb. & Bonpl. Pl. Aequin 1: 139. 1807.

*Boldoa lanceolata* Lag. Gen. & Sp. Nov. 10. 1816.

Shrub, or frutescent only at the base, 1–5 meters high, much branched, the branches ascending, green, terete or subangulate, soft-puberulent or short-villous, those of the inflorescence densely short-villous with usually fulvous hairs; petioles slender, 5–12 mm. long; leaf-blades broadly ovate-rhombic to lance-ovate, 3–8 cm. long, 1.5–4.5 cm. wide, very acute to obtuse at the apex, rarely rounded and apiculate, very abruptly acuminate at the base, bright-green, densely puberulent or short-villous, the veins often prominent, the lateral ones arcuate-ascending, the leaves of the inflorescence usually much reduced; flowers in dense racemes 1–2 cm. long with densely short-villous rachises, arranged in dense, large or small corymbs; pedicels slender, 2–6 mm. long, densely short-villous and viscid; perianth reddish-green, 6–7 mm. long, angulate, densely short-villous and viscid, shallowly 5-dentate, the teeth broadly triangular, obtuse or acutish, connivent or incurved; stamens 4, long-exserted, flexuous; fruit suborbicular, compressed, 2 mm. long, seed black, lustrous, smooth.

TYPE LOCALITY: Near Acapulco, Guerrero.

DISTRIBUTION: In sandy or alluvial soil, Jalisco to Oaxaca.

ILLUSTRATIONS: Humb. & Bonpl. Pl. Aequin. 1: pl. 44; Poir. Tab. Encyc. Suppl. pl. 906.

### 4. *Salpianthus macrodontus* Standley, Contr. U. S. Nat. Herb. 13: 393. 1911.

*Boldoa lanceolata macrodonta* Heimerl, Repert. Sp. Nov. 12: 222. 1913.

Plants 1–2 meters high, herbaceous, or suffrutescent at the base, branched, the branches ascending, stout or slender, subangulate, puberulent; petioles slender, 4–15 mm. long; leaf-blades rhombic-ovate, lance-ovate, or deltoid-ovate, 3–6.5 cm. long, 1.3–3.5 cm. wide, acute to attenuate at the apex or often only acutish, frequently apiculate, acute to attenuate at the base, usually abruptly so, bright-green, very minutely puberulent or scaberulous; flowers in dense racemes 1–2 cm. long, the rachises puberulent, forming dense, broad or narrow cymes; pedicels slender, 2–5 mm. long, puberulent or short-villous; perianth reddish-green, 6 mm. long, angulate, finely glandular-puberulent, and with a few very short, villous hairs along the angles, 4-dentate, the teeth triangular or oblong, usually longer than broad, acute or acutish, erect or slightly spreading; stamens 4, long-exserted, flexuous; fruit suborbicular, compressed, 1.5 mm. long; seed black, lustrous, smooth.

TYPE LOCALITY: On cliffs along the sea near the signal station at Mazatlán, Sinaloa.

DISTRIBUTION: In dry soil, Sonora and Sinaloa.

III. **BOUGAINVILLEAE.** Shrubs, erect or scandent, armed with spines. Leaves alternate. Flowers perfect, in clusters of 3, each flower adherent to the costa of a foliaceous, often brightly colored bract; perianth small, greenish, the free portion persistent. Anthocarp dry, eglandular, adnate to the bracts. Embryo curved.

## 7. BOUGAINVILLEA Commers.; Juss. Gen. 91. 1789.

*Josepha* Vell. Fl. Flum. 154. 1825.

Shrubs or small trees, often scandent, glabrous or pubescent, much branched, often armed with spines. Leaves alternate, petiolate, the blades broad, entire. Flowers perfect, ex-involucrate, either solitary among 3 bracts or, more commonly, in a 3-flowered axillary inflorescence consisting of 3 large persistent colored bracts, a flower being borne on the inner side of each bract, its pedicel confluent with the costa of the bract; perianth tubular, the limb 5- (rarely 4-) lobed, the lobes induplicate-valvate, the tube subterete or 5-angled. Stamens 5-10; filaments somewhat unequal, capillary, connate at the base into a short cup; anthers didymous. Ovary stipitate, fusiform, slightly compressed laterally; style short, filiform or subclavate, straight or slightly curved, included, papillose for part or all its length, the larger papillae fimbriate and stigmatose. Anthocarp fusiform, coriaceous, 5-costate. Seed with a thin testa adherent to the pericarp; embryo uncinat, the cotyledons incumbent, enclosing the farinaceous endosperm, the radicle descending.

Type species, *Bougainvillea spectabilis* Willd.

Perianth densely viscid-villous, the lower part nerved but not prominently angled; style stigmatose to the middle; plants usually copiously villous.

1. *B. spectabilis*.

Perianth puberulent or glabrate, prominently angled below; style stigmatose throughout; plants sparsely villous or glabrate.

2. *B. glabra*.

### 1. *Bougainvillea spectabilis* Willd. Sp. Pl. 2: 348. 1789.

*Bougainvillea bracteata* Pers. Syn. Pl. 1: 418. 1805.

*Tricycla spectabilis* Poir. Encyc. Suppl. 5: 358. 1817.

*Josepha augusta* Vell. Fl. Flum. 154. 1825.

*Bougainvillea virescens* Choisy, in DC. Prodr. 13<sup>2</sup>: 437. 1849.

High-climbing woody vine, much branched, armed with numerous spines, the branches flexuous, grayish or reddish-brown, usually copiously fulvous-villous, sometimes glabrate, the spines stout, straight or curved, 4 cm. long or shorter; petioles one third as long as the blades or shorter; leaf blades broadly ovate to suborbicular or rounded-oval, 5-10 cm. long, 2.5-6.5 cm. wide, rounded to acutish at the base and often short-decurrent, abruptly acute or acuminate at the apex, usually densely villous beneath and sparsely short-villous on the upper surface, often glabrate in age; inflorescence 3-flowered, on a slender peduncle 6-17 mm. long; bracts purplish-red or rarely orange, ovate-oval or broadly ovate, 2-4.5 cm. long, 1.5-4 cm. wide, subcordate at the base, abruptly acute or acuminate or sometimes obtuse at the apex, sparsely puberulent or short-villous; perianth 1.5-3 cm. long, the tube green, densely short-villous, the lower part not prominently angled, the limb 6-7 mm. wide, the lobes ovate-triangular, subobtuse, yellowish; stamens 7-10; fruit oblong-ellipsoid, 11-14 mm. long, 5 mm. in diameter, grayish-green, densely short-villous.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Brazil; widely cultivated in tropical and subtropical America, and escaped from cultivation in Bermuda and probably elsewhere in the West Indies and in Central America.

ILLUSTRATIONS: Mart. Fl. Bras. 14<sup>2</sup>: pl. 82; Vell. Fl. Flum. 4: pl. 16; Lam. Tab. Encyc. pl. 294; Gaertn. Fruct. pl. 216; Paxton's Mag. Bot. 12: pl. 51; E. & P. Nat. Pfl. 3<sup>1b</sup>: f. 6.

### 2. *Bougainvillea glabra* Choisy, in DC. Prodr. 13<sup>2</sup>: 437. 1849.

*Bougainvillea spectabilis glabra* Hook. Bot. Mag. pl. 4810. 1854.

High-climbing woody vine, much branched, armed with numerous spines, the branches yellowish or reddish-brown, puberulent when young but soon glabrate, the spines 6-12 mm. long, straight or curved; petioles less than one third as long as the blades, slender; leaf-blades broadly ovate to elliptic-oval or ovate-lanceolate, 4-10 cm. long, 2-5.5 cm. wide, rounded to acute at the base, abruptly or gradually acute to long-acuminate at the apex, puberulent when young but soon glabrate; inflorescence 3-flowered, on a peduncle 1-2.5 cm. long; bracts purplish-red, rarely whitish, broadly ovate or oval, subcordate at the base, obtuse to abruptly acute or acuminate at the base, sparsely puberulent or glabrous; perianth 1.5-2.5 cm. long, the tube



green, densely puberulent or glabrate, the lower part with prominent obtuse angles; stamens 8; fruit turbinate, 7–13 mm. long, 4–5 mm. in diameter, the 5 angles acute.

TYPE LOCALITY: State of Rio de Janeiro, Brazil.

DISTRIBUTION: Brazil; widely cultivated in tropical and subtropical North America and naturalized in Bermuda and apparently in Cuba, Salvador, and Guatemala.

ILLUSTRATIONS: Rev. Hort. 1889: *pl.* 276; Garden 1894: *pl.* 962; Bot. Mag. *pl.* 4810; Gartenflora 1899: *pl.* 1463; Cycl. Am. Hort. *f.* 249.

IV. COLIGNONIEAE. Herbs. Leaves opposite, the uppermost often colored. Flowers perfect, mostly umbellate; perianth small and inconspicuous, the lobes simply valvate, persistent. Anthocarp dry, eglandular. Embryo curved.

#### 8. COLIGNONIA Endl. Gen. Pl. 311. 1837.

Scandent herbs or shrubs, from tuberous roots, much branched, glabrous or pubescent. Leaves opposite, petiolate, the blades broad, entire, sometimes bright-colored. Flowers perfect, exinvolucrate, ebracteate, umbellulate or glomerate; perianth corolla-like or calyx-like, campanulate or funnelform, sometimes almost rotate in age, 3–5-parted, the lobes valvate, the tube 3–5-angled, in age coriaceous and the lobes connivent and sometimes alate. Stamens 5 or rarely 6, opposite the perianth lobes, slightly unequal, usually exserted; filaments filiform-subulate, connate at the base into a short cup; anthers didymous. Ovary subglobose to obovoid, sometimes slightly compressed; style filiform, exserted; stigma capitate or penicillate. Anthocarp ellipsoid to fusiform, 5-costate or broadly winged. Seed with the testa slightly adherent to the pericarp; embryo semicircular to hippocrepiform, enclosing the copious farinaceous endosperm; cotyledons oblong-elliptic, incumbent; radicle elongate, descending.

Type species, *Abronia parviflora* H. B. K.

##### 1. *Colignonia parviflora* (H. B. K.) Endl. Gen. Pl. 311. 1837.

*Abronia parviflora* H. B. K. Nov. Gen. & Sp. 2: 216. 1817.

*Tricratus parviflorus* Spreng. Syst. 1: 536. 1825.

Plants herbaceous, glabrous, the branches 2 meters long or less, slender or stout, brownish or yellowish, striate; leaves numerous, often pseudo-verticillate, the petioles equaling or half longer than the blades; leaf-blades, broadly ovate to ovate-orbicular, 3–4.5 cm. long, 2.8–4.5 cm. wide, broadly rounded at both ends, entire, paler beneath; flowers umbellulate, the umbellules opposite in the axils or subumbellately arranged at the ends of the branches, densely many-flowered; pedicels 2–3 mm. long; perianth 3 mm. long, white, subangulate, the lobes elliptic to obovate-oblong, rounded at the apex; stamens 5; ovary subglobose, the style equaling the ovary, the stigma densely branched.

TYPE LOCALITY: Near Querchu in the Andes of Colombia.

DISTRIBUTION: Panama and Colombia.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 128.

V. MIRABILEAE. Herbs, or the plants rarely suffruticose, unarmed. Leaves opposite. Flowers perfect, subtended by distinct or united bracts; perianth often bright-colored and corolla-like, the free portion withering and deciduous, the lobes induplicate-valvate. Stigma spheric or hemispheric. Anthocarp dry, coriaceous, often glanduliferous. Embryo curved, both the cotyledons developed.

#### 9. HERMIDIUM S. Wats. Bot. King's Expl. 286. 1871.

Perennial herbs, nearly glabrous, with dichotomous stems. Leaves opposite, short-petiolate, the blades broad, entire. Flowers perfect, exinvolucrate, bracteate, glomerate in head-like racemes in the axils and at the ends of the branches, each flower sessile upon a broad foliaceous bract; perianth campanulate, the limb obscurely 5-lobed, induplicate-plicate,

purplish-red, corolla-like, constricted above the ovary. Stamens 5-7; filaments unequal, capillary, united at the base into a short cup; anthers didymous. Ovary globose; style capillary, straight; stigma capitate. Anthocarp ellipsoid, smooth, glabrous, usually with 10 light-colored vertical lines. Seed with the testa adherent to the pericarp; embryo uncinat, enclosing the copious endosperm, the cotyledons orbicular, concave, the radicle descending, incurved.

Type species, *Hermidium alipes* S. Wats.

1. **Hermidium alipes** S. Wats. Bot. King's Expl. 286. 1871.

Plants 2-4 dm. high, the stems arcuate-ascending, sparsely branched, the branches very stout, glaucous, glabrous, or obscurely puberulent above; petioles stout, 2-12 mm. long; leaf-blades orbicular-ovate, suborbicular, or broadly oval-ovate, 4-7 cm. long, 2-5.5 cm. wide, often as broad as long, rounded to obtuse at the base or rarely subcordate, often short-decurrent, obtuse to broadly rounded and apiculate at the apex, or the uppermost acute, green, thick and succulent, with rather prominent lateral nerves, glabrous; flowers in heads of usually 6, these on peduncles 3-10 mm. long, the peduncles at first minutely puberulent but soon glabrate; bracts oblong to broadly ovate, 1.5-2.5 cm. long, subcordate or rounded at the base, rounded or obtuse at the apex and often apiculate, rarely slightly united at the base, thin, glabrous, often tinged with red; perianth 2 cm. long, the limb about 1.7 cm. broad, glabrous; stamens equaling or slightly shorter than the perianth; fruit 7 mm. long, 3.5-4 mm. diameter, slightly narrowed at both ends, dark-olive.

TYPE LOCALITY: On low foothills from the Big Bend of the Truckee River to Oreana on the Humboldt, Nevada.

DISTRIBUTION: Western Nevada and adjacent California.

ILLUSTRATION: S. Wats. Bot. King's Expl. *pl.* 32.

10. **OKENIA** Schlecht. & Cham. Linnaea 5: 92. 1830.

Prostrate annual herbs, much branched, pubescent. Leaves opposite, petiolate, those of a pair very unequal, the blades broad, entire or sinuate. Flowers perfect, solitary, axillary, subtended by 3 minute bracts, the pedicels at first short, but elongating during and after anthesis and penetrating into the soil; perianth funnellform, with a short slender tube, this constricted above the ovary, the limb 5-lobed, the lobes emarginate, induplicate-plicate. Stamens 10-18; filaments capillary, unequal, connate at the base into a short cup; anthers didymous. Ovary oblong; style filiform, exserted; stigma capitate, smooth. Anthocarp oval, rugose, spongy; utricle oval, the pericarp thin. Seed oval; embryo conduplicate, the cotyledons broad, enclosing the copious farinaceous endosperm; radicle elongate, ascending.

Type species, *Okenia hypogaea* Schlecht. & Cham.

1. **Okenia hypogaea** Schlecht. & Cham. Linnaea 5: 92. 1830.

*Okenia grandiflora* Standley, Contr. U. S. Nat. Herb. 13: 397. 1911.

*Okenia Rosei* Standley, Contr. U. S. Nat. Herb. 13: 398. 1911.

Stems 1-20 dm. long, much branched, the branches slender, divaricate, densely viscid-villous; leaves of a pair very unequal, the smaller often shorter than the petiole of the larger one, the petioles 0.5-6 cm. long, often longer than the blades, the blades orbicular-rhombic to oval, oblong, or deltoid-ovate, 1.8-5.5 cm. long, 1-4.5 cm. wide, subcordate to broadly cuneate at the base, unequal, broadly rounded to acutish at the apex, entire or usually sinuate, yellowish-green, densely covered on both surfaces with minute sessile brown glands, viscid-villous; bracts linear-lanceolate, long-attenuate, 2-3 mm. long; pedicels in age often 20-30 cm. long, slender, villous; perianth purplish-red, 3-6 cm. long, densely viscid-villous outside, the limb 1-3.5 cm. broad; fruit 9-13 mm. long, 6-9 mm. in diameter, strongly rugose, brown, glabrous; seed 7 mm. long, dark-brown.

TYPE LOCALITY: Sandhills near Veracruz, Veracruz.

DISTRIBUTION: Sandy coasts, Florida keys; Veracruz to Campeche; Sinaloa to Oaxaca; inland in Jalisco.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 13: *pl.* 75, 76, A; Verh. Zool.-Bot. Ges. Wien 1911: *f.* 1, 2.



**11. AMMOCODON** Standley, Jour. Wash. Acad. Sci. 6: 631. 1916.

Erect or decumbent perennial herbs with thick woody roots, dichotomously much branched, pubescent. Leaves opposite, petiolate, those of a pair more or less unequal, the blades thick and fleshy, entire or sinuate. Flowers often cleistogamous, umbellulate, the umbellules in open cymes, each flower subtended by a minute subulate bract, or a second smaller bract rarely present; perianth campanulate, purplish red, constricted above the ovary, shallowly 5-lobed, the lobes induplicate-plicate. Stamens 2 or rarely 3; filaments filiform, short-connate at the base, free from the perianth; anthers didymous, exserted. Ovary narrowly oblong; style filiform, exserted; stigma peltate, smooth. Anthocarp compressed, broadly 5-winged, the wings hyaline, not nerved. Seed with the testa adherent to the pericarp; embryo conduplicate, the cotyledons enclosing the farinaceous endosperm; radicle elongate, descending.

Type species, *Selinocarpus chenopodioides* A. Gray.

**1. Ammocodon chenopodioides** (A. Gray) Standley, Jour. Wash. Acad. Sci. 6: 631. 1916.

*Selinocarpus chenopodioides* A. Gray, Am. Jour. Sci. II. 15: 262. 1853.

Plants 1.5–3 dm. high, much branched, the branches rather stout, when young densely covered with short appressed inflated white hairs, glabrate in age; petioles 0.5 to 4.5 cm. long; leaf-blades ovate-oval, oval, ovate-oblong, or rarely deltoid, suborbicular, or rhombic-orbicular, 1.5–5 cm. long, 0.6–4 cm. wide, rounded to subcordate at the base, broadly rounded to acute at the apex, often abruptly apiculate, flat or crispate, paler beneath, pubescent like the stems when young, becoming glabrate, the veins usually conspicuous beneath, broad and white; inflorescence much branched, bearing a few reduced leaves, the umbellules few- or many-flowered, the flowers on slender pedicels 1–4 mm. long; perianth 4–5 mm. long and fully as broad or broader, very shallowly lobed, sparsely puberulent outside; fruit 5 mm. long, the wings about 2 mm. broad, glabrate, the body sulcate between the wings, sparsely puberulent; seed oblong-cylindric, 2.5 mm. long, pale-brown.

TYPE LOCALITY: Valleys from Providence Creek to the Rio Grande, Texas.

DISTRIBUTION: In dry, chiefly sandy soil, western Texas, southeastern Arizona, and Chihuahua.

**12. SELINOCARPUS** A. Gray, Am. Jour. Sci. II. 15: 262. 1853.

Erect or decumbent perennial herbs or low shrubs, dichotomously much branched, pubescent. Leaves opposite, those of a pair more or less unequal, petiolate, the blades thick and succulent, entire or sinuate. Flowers perfect, pseudo-axillary, sessile or short-pedicellate, often cleistogamous, each subtended by 2 or 3 very narrow bracts; perianth tubular-funnel-form, the tube elongate or rarely short, not constricted above the ovary, rather abruptly expanded into a broad, shallowly 5-lobed limb, the lobes plicate. Stamens 5 or 6; filaments filiform, short-connate at the base, adherent to the perianth-tube; anthers didymous, usually exserted. Ovary oblong; style filiform, exserted; stigma peltate, smooth. Anthocarp compressed, broadly 3–5-winged, the wings hyaline, not nerved. Seed with the testa adherent to the pericarp; embryo conduplicate, the cotyledons enclosing the farinaceous endosperm; radicle elongate, descending.

Type species, *Selinocarpus diffusus* A. Gray.

Perianth 1 cm. long; leaf-blades linear or linear-oblong, sessile or short-petiolate.. 1. *S. angustifolius*.  
Perianth 2.5–4.5 cm. long.

Leaves long-petiolate, at least the lower ones, the blades ovate to orbicular.

Upper leaves not reduced; fruit 6–7 mm. long.

Upper leaves much reduced, bract-like; fruit 9–10 mm. long.

Leaves sessile or on very short petioles, the blades linear to narrowly ovate-oblong.

Plants without glandular pubescence; leaf-blades 4–12 mm. wide, oblong-lanceolate to ovate-oblong.

Plants glandular-puberulent or glandular-hirtellous; leaf-blades less than 3 mm. wide, linear or spatulate-oblong.

Leaf-blades linear, 1–4 cm. long, obscurely glandular-puberulent or glabrous.

Leaf-blades narrowly spatulate-oblong, 4–11 mm. long, densely glandular-hirtellous.

2. *S. diffusus*.

3. *S. parvifolius*.

4. *S. lanceolatus*.

5. *S. Palmeri*.

6. *S. Purpusianus*.



1. **Selinocarpus angustifolius** Torr. Bot. Mex. Bound. Surv. 170.  
1859.

Plants erect, 1–4 dm. high, fruticose below, much branched from the base and rather sparsely branched above, the branches slender, whitish, glandular-puberulent and bearing numerous short white appressed flat hairs, glabrate in age, the internodes longer than the leaves; petioles 2 mm. long, or shorter, the blades often sessile, oblong-linear or lance-linear, 8–18 mm. long, 1–3 mm. wide, acute to rounded and apiculate at the apex, thick and fleshy, puberulent, and when young covered with numerous short white appressed hairs; flowers few, often cleistogamous, on pedicels 2 mm. long or shorter, the bractlets minute, subulate; perianth 8–10 mm. long, glandular-puberulent outside, the tube 3 mm. long, the limb 7–8 mm. broad; stamens 5; fruit 5.5–7.5 mm. long, the 5 wings 2–2.5 mm. wide, the body costate, puberulent, truncate at both ends.

TYPE LOCALITY: Gravelly tableland near Presidio del Norte, Texas.

DISTRIBUTION: Western Texas and Coahuila.

ILLUSTRATION: Bot. Mex. Bound. Surv. *pl.* 47, A.

2. **Selinocarpus diffusus** A. Gray, Am. Jour. Sci. II. 15: 262. 1853.

*Selinocarpus diffusus nevadensis* Standley, Contr. U. S. Nat. Herb. 12: 388. 1909.

Plants erect or decumbent, from a stout woody root, 1–3 dm. high, much branched from the base and also above, the branches rather slender, covered with short appressed inflated white hairs and very sparsely glandular-puberulent or hirtellous, very leafy; petioles slender or stout, 0.3–2.5 cm. long, often exceeding the blades; leaf-blades oval, oval-ovate, ovate-oblong, or rarely rhombic-orbicular, 1.2–2.5 cm. long, 0.6–1.5 cm. wide, rounded to obtuse at the base, slightly unequal and short-decurrent, broadly rounded to acute at the apex, thick and fleshy, flat or crispate, when young densely covered with short appressed inflated white hairs, glandular-puberulent and scabrous, sometimes glabrate in age; flowers often all cleistogamous, short-pedicellate, the bracts linear-subulate, 3–6 mm. long; perianth 3.5–4.5 cm. long, densely glandular-hirtellous outside, the tube very slender, the limb 1.5 cm. broad, pale greenish-yellow; stamens 5, slightly exerted; fruit 6–7 mm. long, the 5 wings 2–3 mm. long, glabrate, the body subtruncate at both ends, puberulent; seed narrowly elliptic, 4.5 mm. long, light-brown.

TYPE LOCALITY: Rocky hills and valleys from the Pecos to the Limpio, Texas.

DISTRIBUTION: In dry soil, western Texas to southern Utah and Nevada.

ILLUSTRATION: E. & P. Nat. Pfl. 3<sup>1b</sup>: *f.* 5.

3. **Selinocarpus parvifolius** (Torr.) Standley, Contr. U. S. Nat.  
Herb. 12: 388. 1909.

*Selinocarpus diffusus parvifolius* Torr. Bot. Mex. Bound. Surv. 168. 1859.

Plants erect, 2–4 dm. high, suffrutescent at the base, much branched, the branches stout, glandular-puberulent and bearing numerous short stout flat white appressed hairs, glabrate in age, glaucous; petioles stout, 3–6 mm. long; leaf-blades oval to ovate-oval, 1–2.2 cm. long, 0.5–1 cm. wide, obtuse or acute at the base, obtuse or rounded at the apex, thick and fleshy, crispate, puberulent; flowers numerous, terminal, short-pedicellate, subtended by broadly ovate minute bracts, the inflorescence repeatedly dichotomous, dense, bearing numerous orbicular or ovate-orbicular, petiolate, bractlike leaves 2–3 mm. long; perianth 3–4 cm. long, densely glandular-puberulent, the tube very slender, the limb about 13 mm. broad; fruit 9–10 mm. long, 5-winged, the wings 3–4 mm. broad, the body striate, finely glandular-puberulent.

TYPE LOCALITY: Canyons of the Rio Grande, Texas.

DISTRIBUTION: Southwestern Texas.

4. **Selinocarpus lanceolatus** Wooton, Bull. Torrey Club 25: 304.  
1898.

Plants erect or decumbent from a woody base, 1.2–3 dm. high, much branched, densely leafy, covered throughout with slender short appressed white inflated hairs, or in age glabrate,



the branches stout; petioles stout, 3 mm. long or shorter, most of the blades sessile; leaf-blades lance-oblong to lanceolate, the lowest rarely ovate-oblong or ovate-oval, 1–2.8 cm. long, 3–11 mm. wide, cuneate or obtuse at the base, gradually narrowed to the acute to attenuate or rarely obtuse apex, very thick and succulent, flat; flowers numerous, subsessile, the bracts subulate, 3 mm. long or shorter; perianth 3–4 cm. long, the tube slender, 1 mm. in diameter, the limb about 1 cm. broad, pale greenish-yellow; stamens 5; fruit 6–7 mm. long, the wings 2–3 mm. broad, glabrate, the body finely costate, truncate at both ends; seed narrowly oblong, 4 mm. long, pale-brown.

TYPE LOCALITY: On white soil just south of the White Sands, New Mexico.

DISTRIBUTION: In dry, strongly alkaline soil, southern New Mexico and western Texas.

### 5. *Selinocarpus Palmeri* Hemsl. Biol. Centr. Am. Bot. 3: 6. 1882.

Low shrub, obscurely glandular-puberulent on the younger parts but soon glabrate, much branched, the branches stout, ascending; leaves sessile, probably terete, but flat and linear when dry, 1–4 cm. long, 1–1.3 mm. wide, apiculate; flowers few, axillary and terminal, subsessile, the bracts linear-subulate, 2–3 mm. long, long-attenuate; perianth 3.5 cm. long, obscurely glandular-puberulent, the tube very slender, dilated above into a limb 1.5 cm. broad; stamens exerted about 1 cm.; fruit 5-winged, or by abortion 2- or 3-winged, the wings 4–5 mm. broad.

TYPE LOCALITY: San Lorenzo de Laguna, Coahuila.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. *pl.* 70.

### 6. *Selinocarpus Purpusianus* Heimerl, Oesterr. Bot. Zeits. 63: 353. 1913.

Low shrub, 1–2 dm. high, densely branched, the branches divaricate or widely ascending, stout, grayish, densely puberulent and glandular-hirtellous, or glabrate below, the internodes 5–20 mm. long; leaves sessile, the blades narrowly oblong or spatulate-oblong, 4–11 mm. long, 1.5–2 mm. wide, obtuse or rounded at the apex, thick and succulent, densely glandular-hirtellous; flowers few, subsessile, the 2 bracts linear-subulate, 3.5 mm. long; perianth 2.5–3 cm. long, densely glandular-hirtellous outside, the tube very slender; stamens 6; fruit (immature) 6 mm. long, densely puberulent and hirtellous.

TYPE LOCALITY: Sierra del Rey, Coahuila.

DISTRIBUTION: Known only from the type locality.

## 13. WEDELIELLA Cockerell, Torreya 9: 167. 1909.

*Wedelia* Loefl. (Iter Hisp. 180, hyponym. 1758) Reise 240. 1766. Not *Wedelia* Jacq. 1760.

Prostrate annual or perennial herbs, with dichotomous branches, pubescent. Leaves opposite, those of a pair very unequal, petiolate, the blades broad, entire or sinuate. Flowers perfect, in axillary pedunculate clusters of 3, each subtended by a broad green bract, the bracts subequal, slightly united at the base, cucullate, enclosing the fruit; perianth corolla-like, purplish-red or white, short-funnelform, the tube constricted above the ovary, the limb oblique, 4- or 5-lobed, induplicate-plicate. Stamens 4–7, hypogynous; filaments unequal, capillary, exerted; anthers didymous. Ovary ovoid; style capillary; stigma capitate, papillose. Anthocarp coriaceous, obovoid or oval, strongly compressed, 3-costate or cristate on the inner surface, the outer surface bearing 2 parallel longitudinal rows of stipitate glands, the thin margins dentate or entire, inflexed. Seed with the thin testa adherent to the pericarp; embryo uncinat, the broad cotyledons enclosing the farinaceous endosperm; radicle slender, elongate, descending.

Type species, *Allionia incarnata* L.

Fruit with a broad entire crest on the inner side.

1. *W. cristata*.

Fruit not cristate on the inner side.

Involucres very viscid; margins of the fruit usually with few broad teeth, rarely entire; plants perennial.

2. *W. incarnata*.

Involucres not viscid; margins of the fruit with numerous slender teeth; plants annual.

3. *W. glabra*.



1. *Wedeliella cristata* (Standley) Cockerell, *Torreyia* 9: 167. 1909.

*Wedelia cristata* Standley, *Contr. U. S. Nat. Herb.* 12: 331. 1909.

Probably a perennial; stems 2–5 dm. long, much branched, slender, viscid-puberulent below, viscid-villous above, the internodes longer than the leaves; leaves of a pair unequal, the smaller half the size of the larger, the petioles 3–10 mm. long, the blades oval-ovate to elliptic-oblong, 1.2–2.7 cm. long, 0.5–1.5 cm. wide, obtuse to rounded at the base and usually unequal, obtuse or acute at the apex, thick and firm, yellowish-green above, glaucous beneath, flat, scabrous and puberulent on the upper surface, glandular-puberulent beneath; involucre numerous, 5 mm. long, on slender peduncles 1.5 cm. long or shorter, glandular-puberulent and short-villous, the lobes broadly rounded; perianth 6 mm. long; fruit 4–5 mm. long, pale-brown, bearing on the inner surface a broad, entire or obscurely dentate crest, this broadest at the apex, gradually narrowed below, the lateral margins with a few coarse, broad, strongly inflexed teeth, the outer surface bearing 2 parallel rows of very low glands.

TYPE LOCALITY: Holbrook, Arizona.

DISTRIBUTION: Known only from the type locality.

2. *Wedeliella incarnata* (L.) Cockerell, *Torreyia* 9: 167. 1909.

*Allionia incarnata* L. *Syst. ed.* 10. 890. 1759.

*Allionia malacoides* Benth. *Bot. Voy. Sulph.* 44. 1844.

*Wedelia incarnata* Kuntze, *Rev. Gen.* 533. 1891.

*Wedelia incarnata anodonta* Standley, *Contr. U. S. Nat. Herb.* 12: 333. 1909.

*Wedelia incarnata villosa* Standley, *Contr. U. S. Nat. Herb.* 12: 333. 1909.

*Wedelia incarnata nudata* Standley, *Contr. U. S. Nat. Herb.* 12: 334. 1909.

*Wedeliella incarnata anodonta* Cockerell, *Torreyia* 9: 167. 1909.

*Wedeliella incarnata villosa* Cockerell, *Torreyia* 9: 167. 1909.

*Wedeliella incarnata nudata* Cockerell, *Torreyia* 9: 167. 1909.

*Allionia incarnata multiserrata* Heimerl, *Symb. Ant.* 7: 212. 1912.

Perennial from a slender or often very thick, vertical, woody root; stems numerous, 2–10 dm. long, slender or stout, much branched, densely viscid-villous or glandular-puberulent, rarely glabrate, often tinged with red, the internodes short or usually elongate; leaves of a pair very unequal, the petioles 0.3–2.2 cm. long, the blades broadly deltoid-orbicular to oval, oval-ovate, oblong, or ovate, 1–6 cm. long, 0.6–4.5 cm. wide, subcordate or rounded at the base and unequal, rounded to acute at the apex, entire or sinuate, often crispate, thick and somewhat fleshy, yellowish-green above, glaucous or at least paler beneath, glandular-puberulent or viscid-villous, at least when young, frequently scabrous on the upper surface, often glabrate in age; involucre numerous, on slender peduncles 5 cm. long or short, the lobes obovate-orbicular, 5–8 mm. long, rounded or obtuse at the apex, densely viscid-villous; perianth 7–15 mm. long, purplish-red or rarely white, viscid-villous or puberulent outside; fruit 3–4.5 mm. long, pale-brown or olive, the inner side 3-costate, shallowly transverse-rugose, the sides usually with 3–5 low broad teeth, or the teeth rarely more numerous and slender, the margins rarely entire, strongly incurved, the outer surface bearing 2 parallel rows of short-stipitate or long-stipitate glands.

TYPE LOCALITY: Near Cumaná, Venezuela.

DISTRIBUTION: In dry, sandy soil, southeastern California to southern Utah and Colorado, and western Texas, southward to Lower California and Puebla; Hispaniola; Venezuela to Argentina and Chile.

ILLUSTRATIONS: L'Hér. *Stirp. Nov. pl.* 31; Gaertn. *Fruct. pl.* 214; Lam. *Encyc. pl.* 58; Dict. Sci. Nat. *pl.* 96.

3. *Wedeliella glabra* (Choisy) Cockerell, *Torreyia* 9: 167. 1909.

*Allionia incarnata glabra* Choisy, in DC. *Prodr.* 13<sup>2</sup>: 435. 1849.

*Wedelia glabra* Standley, *Contr. U. S. Nat. Herb.* 12: 332. 1909.

Annual; stems 2–8 dm. long, slender, often tinged with red, puberulent, or villous above, very slightly or not at all viscid, often glabrate below; leaves of a pair unequal, the smaller about half the size of the larger, the petioles 3–18 mm. long, the blades ovate-oval, oval, or oblong, rarely ovate-deltoid, 1–4 cm. long, 0.6–2.2 cm. wide, subcordate to broadly cuneate at the base and usually unequal, broadly rounded or obtuse at the apex, often crispate and sinuate, yellowish-green above, glaucous beneath, puberulent or glandular-puberulent when



young but soon glabrate, the veins coarse and very prominent beneath; involucre numerous, 5–7 mm. long, on slender peduncles 3.5 cm. long or shorter, the lobes rounded-obovate, apiculate, puberulent and usually short-villous, finely reticulate-veined; perianth 7–8 mm. long, white or pink, short-villous outside; fruit pale-brown or olive, 3.5 mm. long, 3-costate on the inner surface, coarsely and shallowly rugose, the margins incurved or spreading, each with 5–8 long slender teeth, the outer surface bearing 2 rows of long-stipitate glands; seed narrowly obovate, 2 mm. long, pale-brown.

TYPE LOCALITY: Near the City of Mexico, Mexico.

DISTRIBUTION: In dry sandy soil, Arizona to western Texas, Durango, Zacatecas, and Oaxaca; probably also in southeastern Utah and southwestern Colorado.

#### 14. NYCTAGINIA Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

Perennial herbs with tuberous roots, much branched, viscid-pubescent. Leaves opposite, petiolate, the blades broad, entire or sinuate. Flowers perfect, in long-pedunculate, axillary and terminal, many-flowered heads, each head surrounded by an involucre of numerous narrow unequal bracts; perianth deep-red, funnelform, the tube slender, elongate, constricted above the ovary, abruptly expanded into a 5-lobed induplicate-plicate limb (or the limb rarely, perhaps abnormally, 6-lobed), the lobes entire or emarginate. Stamens 5–8; filaments capillary, unequal, dilated and connate at the base, adnate to the perianth-tube; anthers didymous, exserted. Ovary oblong; style filiform, exserted; stigma capitate, papillose. Anthocarp coriaceous, turbinate, constricted above the base, umbonate at the apex, finely costate. Seed with a membranaceous testa adherent to the pericarp; embryo uncinat, the broad cotyledons enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Nyctaginia capitata* Choisy.

##### 1. *Nyctaginia capitata* Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

*Boerhaavia aggregata* Pavon; Choisy, in DC. Prodr. 13<sup>2</sup>: 429, as synonym. 1849.

*Nyctaginia ovata* Choisy, Mém. Soc. Phys. Genève 12: 167. 1849.

*Boerhaavia capitata* Heimerl, Beitr. Syst. Nyct. 28. 1897.

*Nyctaginia Cockerellae* A. Nelson, Proc. Biol. Soc. Wash. 16: 29. 1903.

Plants erect or decumbent from a tuberous turbinate root sometimes 4.5 cm. in diameter and 10 cm. long, much branched from the base, the branches stout, 1–4 dm. long, viscid-villous or in age glabrate; petioles 1–6 cm. long, those of the lower leaves often longer than the blades; leaf-blades broadly oval to ovate-deltoid, deltoid, or narrowly triangular, often hastately lobed, 4–9 cm. long, 0.6–5.5 cm. wide, subcordate to cuneate at the base and decurrent, usually unequal, rounded to long-attenuate at the apex, thick and slightly fleshy, glaucous beneath, entire or sinuate, often crispate, copiously viscid-villous when young, often glabrate in age; peduncles 2–14 cm. long; bracts numerous, 6–15 mm. long, the outer ones ovate or oblong, very acute, the inner linear, long-attenuate, densely viscid-villous; perianth 3–4 cm. long, densely viscid-villous outside, the limb 10–14 mm. broad; fruit 5 mm. long and 4 mm. in diameter, olive, glabrous; seed turbinate, 3 mm. long and nearly as broad, abruptly constricted at the base, pale-brown.

TYPE LOCALITY: San Antonio, Texas.

DISTRIBUTION: In dry soil, western Texas and southeastern New Mexico to Durango and Nuevo León.

ILLUSTRATION: Mém. Soc. Phys. Genève 12: pl. 1.

#### 15. ACLEISANTHES A. Gray, Am. Jour. Sci. II. 15: 259. 1853.

*Pentacrophys* A. Gray, Am. Jour. Sci. II. 15: 259. 1853.

Low shrubs or perennial herbs, erect or prostrate, with dichotomous pubescent stems. Leaves opposite, petiolate, those of a pair sometimes very unequal, the blades entire or undulate, usually fleshy. Flowers axillary, solitary or in 3-flowered cymes, 1–3-bracteate; perianth funnelform, corolla-like, the tube much elongate and slender, constricted above the ovary, the limb shallowly 5-lobed, the lobes induplicate-plicate. Stamens 2–5; filaments filiform, unequal, exserted, connate into a short cup at the base. Ovary ovoid or oblong; style filiform, exserted; stigma capitate, smooth. Anthocarp oblong-cylindric, truncate, constricted below



the apex, 5-angled or 5-sulcate, the ribs smooth, sometimes bearing a gland at or near the apex, viscid when moistened. Seed with testa adherent to the pericarp; embryo uncinat; cotyledons broad, enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Acleisanthes crassifolia* A. Gray.

Fruit deeply sulcate, the ribs ending above in conspicuous tubercles or glands.

Glands of the fruit on globose tubercles at the summit of the ribs; bracts less than half as long as the fruit; leaf-blades usually rounded at the apex.

Glands in depressions below the tubercles at the summit of the ribs; bracts equaling or exceeding the fruit; leaf-blades mostly acute or abruptly acute.

Fruit not deeply sulcate, 5-angulate, without glands above.

Leaves of a pair very unequal, the smaller one one fourth as long as the larger or smaller; leaf-blades oval.

Leaves of a pair subequal.

Fruit densely covered with short flat white appressed hairs; leaf-blades ovate or ovate-oblong; perianth 4 cm. long.

Fruit glabrous or cinereo-puberulent with slender hairs; leaf-blades chiefly deltoid in outline.

Perianth 9–17 cm. long; leaf-blades mostly acuminate or long-acuminate at the apex.

Perianth 3.5–5.5 cm. long; leaf-blades mostly acute to rounded at the apex.

Leaf-blades rounded or very obtuse at the apex, most of them as broad as long; perianth 3.5–4.5 cm. long.

Leaf-blades acute or sometimes acuminate at the apex; perianth 4–5.5 cm. long.

1. *A. Wrightii*.

2. *A. acutifolia*.

3. *A. anisophylla*.

4. *A. crassifolia*.

5. *A. longiflora*.

6. *A. obtusa*.

7. *A. Greggii*.

## 1. *Acleisanthes Wrightii* (A. Gray) Benth. & Hook.; Hemsl. Biol.

Centr. Am. Bot. 3: 6. 1882.

*Pentacrophys Wrightii* A. Gray, Am. Jour. Sci. II. 15: 261. 1853.

Plants erect or ascending, from a fruticose caudex, 1–3 dm. high, much branched from the base, the branches glandular-hirtellous; leaves of a pair subequal, the petioles 3–15 mm. long, the blades suborbicular to oval, 0.8–2.5 cm. long, 0.6–1.6 cm. wide, rounded at both ends or rarely only obtuse and apiculate at the apex, slightly unequal at the base, thick and firm, often crispate, paler beneath, glandular-hirtellous or puberulent; flowers axillary, solitary, sessile, usually cleistogamous, the bracts linear-subulate, hirtellous, one third as long as the fruit or shorter; perianth of the cleistogamous flowers 5 mm. long, densely glandular-hirtellous, with 2 stamens; fruit oblong, 6 mm. long, truncate at both ends, deeply 5-sulcate, glandular-puberulent, the costæ broad, smooth, each ending above in a globose glanduliferous tubercle.

TYPE LOCALITY: Stony prairies at the Big Bend of the San Pedro River, western Texas.

DISTRIBUTION: Western Texas.

ILLUSTRATION: Bot. Mex. Bound. Surv. pl. 47, B, I.

## 2. *Acleisanthes acutifolia* Standley, Contr. U. S. Nat. Herb. 12: 370.

1909.

*Pentacrophys Wrightii* Torr. Bot. Mex. Bound. Surv. 170, in part. 1859. Not *P. Wrightii* A. Gray, 1853.

Plants ascending or procumbent, from a thick woody base, much branched from the base, the branches stout, 1–4 dm. long, puberulent and sparsely glandular-hirtellous, glaucous; leaves of a pair subequal, the petioles 3–8 mm. long, or wanting in the uppermost leaves, the blades oblong-elliptic to oval, 1.2–5 cm. long, 0.4–2 cm. wide, obtuse to acute at the base, obtuse or acute at the apex, usually crispate, thick and fleshy, glaucescent beneath; flowers axillary, sessile or short-pedicellate, usually solitary, the bracts linear-subulate, equaling or often slightly exceeding the fruit, the perianth 4–4.5 cm. long, glandular-puberulent or hirtellous outside, the tube slender, 1.5 mm. in diameter, the limb 2–2.5 cm. broad; stamens 5, short-exserted; fruit oval-oblong, 6 mm. long, rounded at the base, constricted and truncate at the apex, glandular-puberulent or glabrate, 5-sulcate, the costæ broad, flat, smooth, each bearing a gland in a depression below the apex.

TYPE LOCALITY: Maxon's Spring, Texas.

DISTRIBUTION: Southwestern Texas, Chihuahua, and Coahuila.

ILLUSTRATION: Bot. Mex. Bound. Surv. pl. 47, f. B, B2, B3 (as *Pentacrophys Wrightii*).



3. *Acleisanthes anisophylla* A. Gray, Am. Jour. Sci. II. 15: 261.  
1853.

Plants prostrate, from a stout or slender fruticose root, much branched from the base, the branches slender, cinereo-puberulent; leaves of a pair very unequal, the smaller scarcely longer than the petioles of the larger ones, the petioles of the larger leaves 3–10 mm. long, the blades oval, oblong-oval, or oval-rhombic, obtuse or rounded at the base, unequal and short-decurrent, rounded to obtuse at the apex and apiculate, thick and succulent, flat, minutely puberulent when young, becoming glabrate, the blades of the larger leaves 1–5 cm. long and 0.6–2.7 cm. wide; flowers axillary, solitary, sessile, the bracts linear-subulate, less than half as long as the fruit; perianth 4–5 cm. long; fruit 5-angulate, costate, sparsely puberulent or soon glabrate.

TYPE LOCALITY: Prairies of Turkey Creek and Elm Creek, western Texas.

DISTRIBUTION: Known only from the type locality.

4. *Acleisanthes crassifolia* A. Gray, Am. Jour. Sci. II. 15: 260.  
1853.

Stems procumbent, sparsely branched, 2–5 dm. long, stout, covered with short stout flat white appressed hairs, or in age glabrate, the internodes mostly longer than the leaves; leaves of a pair subequal, the petioles stout, 3–10 mm. long, the blades ovate, oblong-ovate, or rarely narrowly deltoid-ovate, 2.5–3.5 cm. long, 1.2–2 cm. wide, obtuse to broadly rounded at the base, obtuse or acutish at the apex and abruptly apiculate, flat, thick and succulent, when young pubescent like the stems but in age glabrate; bracts linear-lanceolate, long-attenuate, less than half as long as the fruit; flowers few, sessile, the perianth about 4 cm. long, slender, densely cinereo-puberulent outside; fruit oval-oblong in outline, 6 mm. long, 4 mm. in diameter, truncate at both ends, shallowly 5-sulcate, the ribs broad and flat, densely covered with short flat white appressed hairs.

TYPE LOCALITY: High prairies of San Felipe Creek, western Texas.

DISTRIBUTION: Western Texas.

5. *Acleisanthes longiflora* A. Gray, Am. Jour. Sci. II. 15: 261.  
1853.

Plants decumbent or ascending, from a slender or thick woody root, much branched, the branches slender, 2–5 dm. long, cinereo-puberulent or rarely short-hirtellous, glabrate below; leaves of a pair subequal, the petioles stout or slender, 3–8 mm. long, the blades broadly deltoid-ovate or rhombic-ovate to deltoid, lanceolate, or linear-lanceolate, 1.5–4.5 cm. long, 0.3–3.5 cm. wide, truncate to acute at the base and decurrent, acuminate or rarely acute to long-attenuate at the apex, thick and succulent, glaucous, often crispate, the margins then undulate or when dry apparently coarsely dentate, sparsely cinereo-puberulent when young or rarely short-puberulent, soon glabrate; flowers axillary, solitary, sessile or subsessile, the bracts linear-subulate, half as long as the fruit or shorter, the perianth 9–17 cm. long, white tinged with purple, sparsely and minutely puberulent outside, the tube very slender, 1.5–2 mm. in diameter, the limb 1.5–2 cm. broad; stamens short-exserted; fruit narrowly oblong, 5–6 mm. long, truncate at both ends, 5-angulate, puberulent or rarely short-hirtellous, often glabrate.

TYPE LOCALITY: Valley of the Limpio, western Texas.

DISTRIBUTION: In dry, often alkaline soil, southern and western Texas to Riverside County, California, southward to Chihuahua and Coahuila.

ILLUSTRATION: Bot. Mex. Bound. Surv. *pl.* 46.

6. *Acleisanthes obtusa* (Choisy) Standley, Contr. U. S. Nat. Herb.  
12: 371. 1909.

*Nyctaginia obtusa* Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

*Acleisanthes Berlandieri* A. Gray, Am. Jour. Sci. II. 15: 260. 1853.

Plants procumbent, much branched, the branches slender, densely cinereo-puberulent, becoming glabrate, the internodes often exceeding the leaves; leaves of a pair subequal, the

petioles slender, 0.5–2 cm. long, the blades rounded-deltoid, 1.5–4 cm. long, 1.5–4.5 cm. wide, usually as broad as long or even broader, truncate or subcordate at the base, subtruncate, broadly rounded, or rarely acute at the apex, rather thin, bright-green, sparsely cinereo-puberulent when young, becoming glabrate; flowers axillary or in short-pedunculate 3-flowered cymes, usually short-pedicellate, the bracts linear-subulate, usually equaling the fruit, the perianth 3.5–4.5 cm. long, white tinged with purple, sparsely cinereo puberulent outside, the limb 2 cm. broad; stamens slightly exserted; fruit narrowly oblong, 5–6 mm. long, truncate at both ends, obtusely 5-angulate, cinereo-puberulent or short-villous.

TYPE LOCALITY: Between the Rio Frio and Rio de las Nueces, western Texas.  
DISTRIBUTION: Southwestern Texas.

7. *Acleisanthes Greggii* Standley, Contr. U. S. Nat. Herb. 12: 371.  
1909.

Plants fruticose below, much branched, the branches slender, cinereo-puberulent, the internodes equaling or longer than the leaves; leaves of a pair subequal, the petioles slender, 3–10 mm. long, the blades broadly deltoid or ovate-deltoid, 1–2.5 cm. long, 0.5–2 cm. broad, truncate to slightly subcordate at the base or rarely obtuse, short-decurrent, acute to sub-acuminate at the apex, thick and fleshy, flat, glabrous, or when young sparsely cinereo-puberulent; flowers few, solitary or 3 together, sessile or short-pedicellate, the bracts linear-subulate, half as long as the fruit or shorter, the perianth 4–5.5 cm. long, white tinged with purple, the tube very slender, sparsely cinereo-puberulent, the limb 1.5 cm. broad; filaments red, exserted; fruit narrowly oblong in outline, 6 mm. long, 2.5 mm. in diameter, obtusely 5-angulate, truncate at both ends, finely cinereo-puberulent.

TYPE LOCALITY: Monterey, Nuevo León.  
DISTRIBUTION: Southwestern Texas to Nuevo León and Tamaulipas.

16. *BOERHAAVIA* L. Sp. Pl. 3. 1753.

*Dantia* (Lippi) Choisy, in DC. Prodr. 13<sup>2</sup>: 449, as synonym. 1849.

Annual or perennial herbs, sometimes fruticose at the base, branched, variously pubescent, the stems often with viscous areas in the internodes. Leaves opposite, petiolate, those of a pair sometimes unequal, the blades entire or sinuate. Flowers perfect, small, umbellate, cymose, capitate, racemose, or solitary, bracteate, the bracts usually minute; perianth corolla-like, campanulate or nearly rotate, constricted above the ovary, the limb shallowly 5-lobed. Stamens 1–5, exserted or included; filaments capillary, unequal, connate at the base; anthers didymous. Ovary stipitate; style filiform; stigma peltate. Anthocarp obovoid or obpyramidal, 3–5-angulate, rarely 3–5-winged, glabrous or pubescent, symmetric. Seed with the thin testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the scanty endosperm; radicle elongate, descending.

Type species, *Boerhaavia repens* L.

Fruit pubescent; perennials.

Flowers capitate or glomerate, sessile or short-pedicellate

Branches of the inflorescence glabrous; stems usually glabrous except about the nodes, there puberulent; flowers in clusters of 2–4.

Branches of the inflorescence puberulent or glandular-puberulent; stems copiously pubescent; flowers usually in many-flowered heads.

Flowers solitary on long slender pedicels.

Pubescence of the fruit glandular; stems hirsute below.

Pubescence of the fruit not glandular; stems puberulent or glabrous below.

Fruit glabrous.

Plants perennial.

Leaf-blades suborbicular to broadly ovate.

Flowers glomerate at the ends of long slender axillary peduncles; perianth about 5 mm. broad.

Flowers in ample terminal cymes; perianth 8–13 mm. broad.

Leaf-blades linear to linear-lanceolate.

Stems glabrous, at least below; stamens usually 3.

Stems copiously hirsute or hirtellous below; stamens 5.

Stems glandular-hirsute below.

Stems usually glandular-puberulent and hirtellous below, never glandular-hirsute.

1. *B. coccinea*.

2. *B. caribaea*.

3. *B. Hitchcockii*.

4. *B. gracillima*.

5. *B. ciliata*.

6. *B. anisophylla*.

7. *B. tenuifolia*.

8. *B. Lindheimeri*.

9. *B. linearifolia*.



Plants annual.

Flowers not racemose.

Branches of the inflorescence glandular-villous; bracts large, as long as the fruit, persistent.

Branches of the inflorescence puberulent or glabrous; bracts minute, much shorter than the fruit, often deciduous.

Fruit winged, the broad or narrow wing sharply differentiated from the body.

Fruit 4-winged, abruptly contracted into a short winged stipe.

Fruit 5-winged, not stipitate.

Perianth about 1 mm. long; fruit nearly twice as long as broad; flowers short-pedicellate.

Perianth 3 mm. long; fruit nearly as broad as long; flowers long-pedicellate.

Fruit not winged, the angles sometimes thin but evidently continuous with the body of the fruit.

Fruit 3- or 4-angled.

Fruit 5-angled.

Fruit 3-4 mm. long.

Perianth about 3 mm. long; fruit 2-2.5 mm. broad, the angles thin, strongly compressed.

Perianth less than 2 mm. long; fruit 1.5 mm. broad or less, the angles thick.

Fruit 2.2-2.7 mm. long.

Flowers in few-flowered simple umbels.

Flowers mostly in dense headlike cymes or in compound umbels.

Flowers racemose.

Fruit 4-angulate; bracts persistent, equaling the fruit.

Fruit 5-angulate; bracts deciduous, small.

Fruit truncate at the apex.

Fruit rounded at the apex.

Ribs of the fruit broad, obtuse, almost touching each other, the sulci very narrowly linear, smooth.

Perianth 3 mm. long; leaf-blades lanceolate, brown-punctate beneath.

Perianth 1-1.5 mm. long; leaf-blades mostly oval or oblong, epunctate.

Ribs of the fruit narrow, acute, the sulci broad and open, transverse-rugulose.

Perianth 2.5-3 mm. long; stamens exserted.

Perianth 1-1.5 mm. long; stamens included.

Racemes remotely flowered; bracts lanceolate, shorter than the ovary at anthesis; stems slightly viscid-puberulent below.

Racemes densely flowered; bracts orbicular-ovate, usually much longer than the ovary; stems very viscid, especially below.

10. *B. purpurascens*.

11. *B. pterocarpa*.

12. *B. megaptera*.

13. *B. alata*.

14. *B. triquetra*.

15. *B. maculata*.

16. *B. erecta*.

17. *B. intermedia*.

18. *B. lateriflora*.

19. *B. Wrightii*.

20. *B. Rosei*.

21. *B. alamosana*.

22. *B. Coulteri*.

23. *B. Xanti*.

24. *B. Torreyana*.

25. *B. spicata*.

1. **Boerhaavia coccinea** Mill. Gard. Dict. ed. 8. Boerhaavia no. 4. 1768.

*Boerhaavia diffusa* Sw. Obs. Bot. 10. 1791. Not *B. diffusa* L. 1753.

*Boerhaavia paniculata* Rich. Act. Soc. Hist. Nat. Par. 1: 105. 1792.

*Boerhaavia adscendens* Willd. Sp. Pl. 1: 19. 1797.

*Boerhaavia decumbens* Vahl, Enum. Pl. 1: 284. 1804.

*Boerhaavia laxa* Pers. Syn. Pl. 1: 36. 1805.

*Boerhaavia diffusa paniculata* Kuntze, Rev. Gen. 533. 1891.

*Boerhaavia coccinea parcehirsuta* Heimerl, Symb. Ant. 7: 212. 1912.

Perennial, from a stout or slender, often fusiform, somewhat fleshy root; stems few or numerous, ascending or procumbent, 2-10 dm. long, sparsely branched, minutely puberulent below or sometimes sparsely villous, especially at the nodes, glabrous above, brownish; petioles slender, 0.3-3 cm. long, usually sparsely villous; leaf-blades rhombic-orbicular, broadly rhombic-ovate, oval, or oval-oblong, 2-5.5 cm. long, 1.5-5 cm. wide, subcordate to broadly rounded at the base, broadly rounded to obtuse or rarely acute at the apex, entire or usually subsinuate, bright-green above, pale beneath, epunctate, glabrous or obscurely puberulent, villous-ciliate, rarely villous beneath along the veins; inflorescence of ample, naked, lax, terminal or axillary cymes, much branched, the branches slender, ascending or divergent, glabrous, the flowers subsessile in glomerules of 2-4 on the ends of filiform peduncles 3-10 mm. long, the bracts minute, lanceolate or ovate, deciduous; perianth reddish-green, 2 mm. broad, minutely glandular-puberulent; stamens 2, short-exserted; fruit narrowly obovoid, 3-4 mm. long, rounded at

the apex, densely glandular-puberulent or glandular-pilose, 5-sulcate, the angles and sulci smooth.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Peninsular Florida; adventive on ballast in eastern North Carolina, Bahamas and throughout the West Indies; Costa Rica; also in the warmer parts of South America and Africa.

ILLUSTRATION: Mart. Fl. Bras. 14<sup>2</sup>: pl. 86.

## 2. *Boerhaavia caribaea* Jacq. Obs. Bot. 4: 5. 1771.

*Boerhaavia polymorpha* Rich. Act. Soc. Hist. Nat. Par. 1: 185. 1792.

*Boerhaavia hirsuta* Willd. Phytog. 1: 1. 1794.

*Boerhaavia viscosa* Lag. & Rodr. Anal. Ci. Nat. 4: 256. 1801.

*Boerhaavia squamata* Raf. Aut. Bot. 40. 1840.

*Boerhaavia glandulosa* Anderss. Sv. Vet.-Akad. Handl. 1853: 171. 1854.

*Boerhaavia Sonorae* Rose, Contr. U. S. Nat. Herb. 1: 110. 1891.

*Boerhaavia diffusa hirsuta* Kuntze, Rev. Gen. 533. 1891.

*Boerhaavia diffusa viscosa* Heimerl, Beitr. Syst. Nyct. 27. 1897.

*Boerhaavia viscosa oligadena* Heimerl, Ann. Cons. Jard. Genève 5: 189. 1901.

*Boerhaavia ramulosa* M. E. Jones, Contr. West. Bot. 10: 40. 1902.

*Boerhaavia viscosa apiculata* Standley, Contr. U. S. Nat. Herb. 12: 383. 1909.

*Boerhaavia ixodes* Standley, Contr. U. S. Nat. Herb. 13: 423. 1911.

Perennial, from a thick woody root; stems usually numerous, 3–15 dm. long, decumbent to prostrate, sparsely branched below, the branches stout, green or brownish, below viscid-puberulent and often also sparsely or densely hirsute, above densely glandular-puberulent or often merely puberulent and slightly viscid; petioles slender or stout, 0.3–4 cm. long; leaf-blades suborbicular, ovate-orbicular, broadly oval, oval-oblong, oblong, or rarely ovate-oblong, 1.5–5.5 cm. long, 0.8–5 cm. wide, truncate to rounded at the base, broadly rounded to obtuse or sometimes acute or attenuate at the apex, often apiculate, entire or conspicuously sinuate, rather thin or rarely coriaceous, bright-green above, pale beneath, sometimes brown-punctate, glabrous, puberulent, sparsely villous beneath, or often densely hirsute or hirtellous throughout and viscid; inflorescence of ample naked, terminal or axillary cymes, or sometimes of axillary long-pedunculate heads, the cymes much branched, the branches slender, puberulent or densely glandular-puberulent, the flowers subsessile or short-pedicellate, in few- or many-flowered heads borne on slender peduncles 0.3–3.5 cm. long; bracts minute, lanceolate, viscid-puberulent, persistent or deciduous; perianth purplish-red, 2 mm. broad, puberulent or glandular-puberulent outside; stamens 1–3, short-exserted; fruit narrowly obovoid, 2.5–3 mm. long, densely glandular-puberulent, 5-sulcate, the angles and sulci smooth.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Peninsular Florida; southern and western Texas to southern California, southward throughout Mexico and Central America; throughout the West Indies; also widely distributed in northern and western South America.

ILLUSTRATIONS: Jacq. Fragm. Bot. pl. 47, f. 2; Jacq. Hort. Vindob. 1: pl. 3, f. 7; Jacq. Obs. Bot. pl. 84.

## 3. *Boerhaavia Hitchcockii* Standley, sp. nov.

? *Boerhaavia anisophylla micrantha* Heimerl, Ann. Cons. Jard. Genève 5: 187. 1901.

*Boerhaavia gracillima* Standley, Contr. U. S. Nat. Herb. 13: 420, in part. 1911. Not *B. gracillima* Heimerl, 1889.

Perennial; stems prostrate or procumbent, up to 2 meters long, much branched, the branches stout, glandular-hirsute below and minutely puberulent, minutely puberulent above; petioles stout, 0.5–2 cm. long; leaf-blades ovate-orbicular, broadly oval, or broadly deltoid-ovate, rarely ovate-oblong, 1.5–3.2 cm. long, 0.8–2.5 cm. wide, subcordate or rounded at the base, rounded and apiculate to obtuse or rarely acute at the apex, subsinuate, thick and firm, green above, glaucous or glaucescent beneath, hirtellous or sparsely glandular-pilose, glabrate in age; inflorescence a much branched, broad, naked, terminal cyme, the branches slender or filiform, ascending or divergent, glabrous, the numerous flowers solitary on filiform pedicels 5–10 mm. long, the bracts minute, lanceolate, deciduous or subpersistent, purplish; perianth purplish-red, 5–6 mm. broad, viscid-puberulent; stamens 3; fruit narrowly obovoid, rounded at the apex, 3 mm. long, densely glandular-puberulent, 5-angulate, the angles rounded, smooth, the sulci smooth.

Type collected at Tehuacán, Puebla, Mexico, August 9, 1910, A. S. Hitchcock (U. S. Nat. Herb. no. 618514).

DISTRIBUTION: Vicinity of the type locality.



4. *Boerhaavia gracillima* Heimerl, Bot. Jahrb. 11: 86. 1889.

*Boerhaavia erecta* Benth. Pl. Hartw. 9. 1839. Not *B. erecta* L. 1753.

*Boerhaavia paniculata* Benth. Pl. Hartw. 343. 1848. Not *B. paniculata* Rich. 1792.

*Boerhaavia anisophylla paniculata* Coult. Contr. U. S. Nat. Herb. 2: 356. 1894.

*Boerhaavia organensis* Standley, Contr. U. S. Nat. Herb. 12: 385. 1909.

*Boerhaavia gracillima glabrata* Heimerl; Standley, Contr. U. S. Nat. Herb. 12: 386. 1909.

Perennial, from a thick woody root; stems numerous, decumbent or procumbent, 3–10 dm. long, much branched, the branches slender, minutely and obscurely puberulent, or very rarely pilose, glaucous or pale-brown; petioles stout, 0.3–2.5 cm. long; leaf-blades broadly rhombic, suborbicular, broadly oval, elliptic-oblong, or broadly ovate, 2–4 cm. long, 1–3.5 cm. wide, subcordate or rounded at the base, broadly rounded to acute or rarely abruptly acuminate at the apex, thick and firm, often coriaceous, bright-green or often glaucous, especially beneath, epunctate, entire or slightly sinuate, prominently veined, glabrous, or when young obscurely puberulent; inflorescence of numerous axillary and terminal cymes or of axillary 1- or 2-flowered peduncles, the cymes much branched, the branches very slender or filiform, divergent, glabrous, the flowers usually on filiform pedicels 5–10 mm. long, the bracts minute, lanceolate, glabrous, deciduous; perianth deep purplish-red, 5 mm. broad, puberulent outside or very rarely glabrate; stamens 2 or 3; fruit narrowly oblong-obovoid, 3.5–4 mm. long, rounded at the apex, short-pilose or puberulent or very rarely glabrate, 5-angulate, the angles narrowly rounded, smooth, the sulci smooth.

TYPE LOCALITY: In fields, Aguascalientes, Aguascalientes.

DISTRIBUTION: Dry plains and rocky hillsides, western Texas and southern New Mexico to Lower California and Oaxaca.

ILLUSTRATION: Bot. Jahrb. 11: pl. 2, f. 1a–1g.

5. *Boerhaavia ciliata* Brand. Univ. Calif. Publ. Bot. 4: 270. 1912.

Perennial, from a thick woody root, the stems numerous, procumbent, 2–5 dm. long, sparingly branched, the branches slender, finely puberulent and glandular-pilose; petioles slender, 2–8 mm. long; leaf-blades suborbicular to broadly oval, rarely oval-ovate, 0.6–2 cm. long, 0.6–1.2 cm. wide, often broader than long, subcordate to broadly rounded at the base, broadly rounded to acute at the apex, apiculate, firm, bright-green above, glaucescent or pale yellowish-green beneath, epunctate, entire, sparsely glandular-pilose, glabrate in age; flowers subsessile or on slender pedicels 1–5 mm. long, solitary or 2–3-glomerate at the ends of filiform, glabrous or pilose, axillary or terminal peduncles 0.5–4.5 cm. long, the bracts minute, linear to lanceolate, attenuate, persistent, purplish, ciliate; perianth purplish-red, about 5 mm. broad, sparsely puberulent or pilose outside; stamens 4; fruit obovoid-oblong, 2.5 mm. long, rounded at the apex, glabrous, 5-angulate, the angles rounded, smooth, the sulci smooth.

TYPE LOCALITY: Near Minas de San Rafael, San Luis Potosí.

DISTRIBUTION: Known only from the type locality.

6. *Boerhaavia anisophylla* Torr. Bot. Mex. Bound. Surv. 171. 1859.

*Boerhaavia Palmeri* S. Wats. Proc. Am. Acad. 18: 142. 1883.

Perennial, from a thick woody root; stems few or numerous, ascending or procumbent, 1.5–5 dm. long, sparsely branched, the branches slender, grayish, densely puberulent below and hirtellous or rarely glandular-hirtellous, puberulent or glandular-puberulent above; petioles stout, 2–10 mm. long; leaf-blades oval, broadly deltoid, oval-ovate, broadly ovate, or oblong, 1–3 cm. long, 0.5–2 cm. wide, cordate or rounded at the base, broadly rounded to obtuse or rarely acute at the apex, entire or sinuate, coriaceous, green above, glaucous beneath, scaberulous or short-hirtellous, glabrate in age, minutely brown-punctate beneath; inflorescence cymose, much branched or sparingly branched, the branches slender, glandular-puberulent, the flowers subsessile or short-pedicellate, in few-flowered glomerules, the bracts lanceolate or ovate, acuminate or attenuate, thin, persistent, purplish-red, ciliate; perianth bright purplish-red, 8–13 mm. broad, puberulent outside; stamens 5; fruit obovoid-oblong, rounded at the apex, glabrous, 5-angulate, the angles broad, rounded, smooth, the narrow sulci smooth.

TYPE LOCALITY: Entrance of the Great Canyon of the Rio Grande, Texas.

DISTRIBUTION: Dry rocky hillsides, extreme western Texas to Chihuahua and Nuevo León.



7. *Boerhaavia tenuifolia* A. Gray; Coult. Contr. U. S. Nat. Herb.  
2: 355. 1894.

*Boerhaavia linearifolia glabrata* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

Perennial, from a woody base, sparsely branched, the branches 2–4 dm. long, very slender, glaucous, glabrous below, sometimes obscurely scaberulous above; petioles stout, 1–2 mm. long; leaf-blades linear, 1–2.5 cm. long, 1.5 mm. broad, coriaceous, glaucous, glabrous, the margins strongly revolute; inflorescence cymose, axillary and terminal, much branched, the branches viscid-puberulent, the flowers numerous, on pedicels 1–2 mm. long; bracts minute, ovate or lanceolate, abruptly attenuate, minutely puberulent or glabrate; perianth purplish-red, 8–10 mm. broad, puberulent outside; stamens 3; fruit obovoid, rounded at the apex, 5-angulate, 2.5–3 mm. long, glabrous, the angles broad and smooth, the sulci between them smooth.

TYPE LOCALITY: Camp Charlotte, Ixion County, Texas.

DISTRIBUTION: Dry hillsides, western Texas.

8. *Boerhaavia Lindheimeri* Standley, sp. nov.

*Boerhaavia linearifolia glandulosa* Standley, Contr. U. S. Nat. Herb. 12: 387. 1909. Not *B. glandulosa* Anderss. 1854.

Perennial, from a thick woody root, the stems several or numerous, ascending or procumbent, sparsely branched, the branches stout, divergent or ascending, densely glandular-hirsute and glandular-puberulent below, densely glandular-puberulent above, the internodes mostly longer than the leaves; petioles 1–3 mm. long; leaf-blades lance-linear, lanceolate, or linear, broadest at the base and gradually narrowed upward, 1.5–4 cm. long, 2–10 mm. wide, rounded or obtuse at the base, acute to acuminate at the apex, thinly coriaceous, green above, pale beneath and brown-spotted, glandular-hirtellous or in age glabrate; inflorescence cymose, much branched, nearly naked, the slender branches glandular-puberulent, the flowers solitary, on pedicels 1–3 mm. long; bracts minute, persistent, lanceolate, attenuate, brown-dotted; perianth purplish-red, 7–9 mm. long and broad, puberulent outside; stamens 5; fruit obovoid-oblong, rounded at the apex, 3 mm. long, glabrous, 5-angulate, the angles rounded, smooth, the narrow sulci smooth.

TYPE LOCALITY: Texas.

DISTRIBUTION: Southwestern Texas.

9. *Boerhaavia linearifolia* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

*Boerhaavia tenuifolia* Standley, Contr. U. S. Nat. Herb. 12: 386, in part. 1909. Not *B. tenuifolia* A. Gray, 1894.

Perennial, from a thick woody root; stems numerous, ascending or procumbent, 1–4 dm. long, much branched, the branches slender, gray or white, hirsute or hirtellous and glandular-puberulent below, densely glandular-puberulent above; petioles stout, 1–3 mm. long; leaf-blades linear to lanceolate, rarely narrowly triangular, 1.2–3.5 cm. long, 2–7 mm. wide, obtuse to rounded at the base and often unequal, broadest at the base and usually tapering gradually to the obtuse or acute apex, coriaceous, usually glaucous, at least beneath, hirsute or hirtellous when young, glabrate in age, spotted with brown beneath; inflorescence cymose, much branched, naked or nearly so, the slender branches ascending or divergent, glandular-puberulent, the numerous flowers subsessile or on pedicels 1–3 mm. long, the bracts minute, persistent, ovate or lanceolate, acuminate or attenuate, brown-dotted; perianth purplish-red, 7–8 mm. long, about 1 cm. broad, puberulent outside; stamens 5; fruit obovoid-oblong, 2.5–3 mm. long, glabrous, 5-angulate, the angles broad, rounded, smooth, the broad or narrow sulci smooth.

TYPE LOCALITY: Western Texas.

DISTRIBUTION: Dry, rocky hillsides, western Texas and southeastern New Mexico to Coahuila.

10. *Boerhaavia purpurascens* A. Gray, Am. Jour. Sci. II. 15: 321.  
1853.

Erect annual, 2–5 dm. high, much branched below, the branches slender, brown-punctate, puberulent below, densely viscid-villous or glandular-hirtellous above; petioles slender, 0.4–



2.2 cm. long; leaf-blades oval to oblong, suborbicular, or ovate, or the uppermost lanceolate or linear-oblong, 1.2–3 cm. long, 0.7–2 cm. wide, rounded or obtuse at the base, broadly rounded to very acute at the apex, often apiculate, entire or subsinuate, thin, bright-green above, paler beneath, often brown-punctate, glabrous or obscurely puberulent; inflorescence cymose-paniculate, sparsely branched, the branches ascending, densely glandular-villous with short hairs, the flowers short-pedicellate or subsessile, densely cymose-glomerate at the ends of long slender peduncles; bracts oblong or obovate, equaling or exceeding the fruit, persistent, thin, purplish-red, villous and long-ciliate; perianth 3–4 mm. long, pink, glandular-punctate; stamens 3, equaling the perianth; fruit obovoid, 2.5–3 mm. long, rounded at the apex, acute at the base, stramineous, glabrous, 5-angulate, the angles low, acute, smooth, the sulci broad, smooth.

TYPE LOCALITY: Stony hills near Santa Rita, New Mexico.

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to southeastern Arizona and Sonora.

11. *Boerhaavia pterocarpa* S. Wats. Proc. Am. Acad. 17: 376. 1882.

Erect or decumbent annual, 1–3 dm. high, sparsely branched, the branches slender, ascending, puberulent, often brown-punctate; petioles slender, 2–12 mm. long; leaf-blades broadly ovate-rhombic to ovate or lanceolate, 1–2.5 cm. long, 0.3–1.5 cm. wide, rounded or obtuse at the base, rounded to attenuate at the apex, entire or subsinuate, thin, green above, slightly paler beneath, glabrous or sparsely puberulent; inflorescence of few terminal and axillary, densely many-flowered, headlike cymes borne on slender peduncles 1–3 cm. long, the flowers on stout pedicels 1 mm. long or shorter; bracts minute, lanceolate, brown-punctate, persistent or deciduous; perianth pink, 1–1.5 mm. long, glandular-punctate; stamens included; fruit broadly obpyramidal, 3 mm. long, truncate at the apex, abruptly contracted into a short stipe below, glabrous, 3- or 4-winged, the wings narrow, gradually tapering downward, thin, smooth, the body of the fruit strongly transverse-rugulose.

TYPE LOCALITY: Apache Pass, Arizona.

DISTRIBUTION: Southeastern Arizona and adjacent Sonora.

12. *Boerhaavia megaptera* Standley, Contr. U. S. Nat. Herb. 12: 379. 1909.

Erect annual, 3–6 dm. high, much branched, the branches slender, ascending, puberulent, tinged with red, brown-punctate, the middle and upper internodes with viscous rings; petioles slender, 0.4–2 cm. long; leaf-blades broadly ovate to oblong, ovate-oblong, or linear-lanceolate, 2–4 cm. long, 0.4–1.7 cm. wide, subcordate to rounded at the base, obtuse to long-attenuate at the apex, entire or subsinuate, glabrous or obscurely puberulent, green above, pale beneath, sparsely brown-punctate; inflorescence cymose-paniculate, much branched, the branches slender, ascending, the flowers on pedicels 1–2 mm. long, umbellate at the ends of short slender peduncles; bracts minute, thin, ovate or lanceolate, brown-punctate, persistent; perianth 1–1.5 mm. long, pink, glandular-punctate; stamens included; fruit 3–4 mm. long, 2–3 mm. broad, truncate at the apex, acutish at the base, glabrous, 5-winged, the wings thin, smooth, the very narrow sulci smooth.

TYPE LOCALITY: On Flattop Mountain, Tucson Mountains, Arizona, at an altitude of 850 meters.

DISTRIBUTION: Vicinity of the type locality.

13. *Boerhaavia alata* S. Wats. Proc. Am. Acad. 24: 69. 1889.

Erect or decumbent annual, 3–6 dm. high, much branched, the branches slender, stramineous, minutely puberulent below, glabrous above, brown-punctate, the middle internodes with viscous rings; petioles slender, 2–8 mm. long; leaf-blades ovate-oblong to lance-oblong, or the uppermost oblong-linear, 2–3.5 cm. long, 2–12 mm. broad, rounded to broadly cuneate at the base, obtuse or acute at the apex, entire, green above, pale beneath, glabrous, sparsely brown-punctate; inflorescence laxly cymose-paniculate, much branched, the branches slender, glabrous, the flowers on pedicels 2–15 mm. long, solitary or umbellate in clusters of 7 or fewer; bracts



minute, lanceolate, brown-punctate, persistent; perianth 3 mm. long, pink, glandular-punctate; stamens 5, included; fruit 4 mm. long and nearly as broad, rounded at the base, emarginate at the apex, glabrous, 5-winged, the wings broad, thin, the body coarsely transverse-rugulose.

TYPE LOCALITY: On a small rocky island in Guaymas harbor, Sonora.

DISTRIBUTION: Vicinity of the type locality.

14. *Boerhaavia triquetra* S. Wats. Proc. Am. Acad. 24: 69. 1889.

Ascending or procumbent annual, 3–6 dm. high much branched, the branches slender, yellowish-green or stramineous, minutely puberulent, the upper internodes with viscous rings; petioles slender, 0.3–1.7 cm. long; leaf-blades oblong-oval to ovate-oblong or lanceolate, 1.5–4 cm. long, 0.4–1.5 cm. wide, rounded or obtuse at the base, obtuse to attenuate at the apex, entire, thick and firm, green above, pale beneath, glabrous, epunctate; inflorescence rather densely cymose, much branched, the branches slender, glabrous, erect or ascending, the flowers on pedicels 1–3 mm. long, in clusters of 2 or 3 at the ends of short slender peduncles; bracts minute, ovate or lanceolate, glandular-punctate, persistent; perianth pink, 1 mm. long, glabrous, brown-punctate; stamens 2, included; fruit obpyramidal, 2–2.5 mm. long, 1.2 mm. broad, truncate at the apex, glabrous, yellowish-green, 3- or 4-angulate, the angles very acute, smooth, the broad sulci coarsely rugulose.

TYPE LOCALITY: Sandy plains and stony ridges about Los Angeles Bay, Lower California.

DISTRIBUTION: Known only from the type locality.

15. *Boerhaavia maculata* Standley, Contr. U. S. Nat. Herb. 12: 379. 1909.

Erect annual, 2–6 dm. high, much branched below, the branches slender, brown-punctate, cinereo-puberulent, some of the upper internodes viscous; petioles slender, 3–12 mm. long; leaf-blades narrowly oblong to lanceolate or linear, 1.2–6 cm. long, 0.2–1.1 cm. wide, rounded or obtuse at the base, acuminate to long-attenuate at the apex, entire, sparsely puberulent or glabrous, green above, pale beneath, brown-punctate on both sides; inflorescence loosely cymose-paniculate, much branched, the branches slender, erect or ascending, the flowers on pedicels 2–10 mm. long, simply umbellate at the ends of long slender peduncles; bracts minute, lanceolate, persistent, brown-punctate; perianth pink, 3 mm. long, 6–7 mm. broad, glabrous, glandular-punctate; stamens 5, exserted; fruit obpyramidal, truncate at the apex, 3.5–4 mm. long, 2–2.5 mm. broad, stramineous, glabrous, 5-angulate, the angles very broad, much compressed, acute, slightly rugose, the narrow sulci strongly rugose.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Dry, rocky hillsides, coast of southern Sonora and northern Sinaloa.

16. *Boerhaavia erecta* L. Sp. Pl. 3. 1753.

*Boerhaavia elongata* Salisb. Prodr. 56. 1796.

*Boerhaavia virgata* H. B. K. Nov. Gen. & Sp. 2: 215. 1817.

*Boerhaavia discolor* H. B. K. Nov. Gen. & Sp. 2: 215. 1817.

*Boerhaavia atomaria* Raf. Aut. Bot. 40. 1840.

*Valeriana latifolia* Mart. & Gal. Bull. Acad. Brux. 11<sup>1</sup>: 124. 1844.

*Boerhaavia Thornberi* M. E. Jones, Contr. West. Bot. 12: 72. 1908.

*Boerhaavia erecta Thornberi* Standley, Contr. U. S. Nat. Herb. 12: 381. 1909.

Annual, erect or decumbent, 2–10 dm. high, much branched at the base and sparsely above, the branches stout or slender, often tinged with red, finely puberulent below, the middle internodes often with brown viscous bands, the uppermost internodes glabrous or minutely puberulent; petioles slender, 0.4–4 cm. long; leaf-blades mostly broadly ovate-rhombic or deltoid-ovate, but sometimes oval, broadly oblong, or ovate, 2–6 cm. long, 1–4.5 cm. wide, truncate to rounded at the base, broadly rounded to obtuse or rarely acute at the apex, entire or usually subsinuate, bright-green above, beneath paler or glaucous and usually brown-punctate, glabrous, or ciliolate or sparsely puberulent, the blades of the uppermost leaves smaller, lanceolate to linear; inflorescence cymose, much branched, the branches slender, erect or ascending, usually glabrous, rarely with viscous internodes, the flowers irregularly umbellate-cymose or subracemose at the ends of long slender peduncles, the pedicels 1–5 mm.



long; bracts minute, linear or lanceolate, reddish, persistent; perianth white or tinged with pink, 1–1.5 mm. long, glabrous, sometimes glandular-punctate; stamens 2 or 3, exserted; fruit narrowly obpyramidal, 3–3.5 mm. long, 1–1.5 mm. broad at the truncate apex, green, glabrous, 5-angled, the angles obtuse or acutish, smooth, the sulci coarsely transverse-rugose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: South Carolina to Florida, Arkansas, and southern Arizona, and southward throughout Mexico, Central America, and the warmer parts of South America; general in the West Indies.

ILLUSTRATIONS: Jacq. Hort. Vindob. *pl.* 5, 6; Gaertn. Fruct. *pl.* 127.

17. *Boerhaavia intermedia* M. E. Jones, Contr. West. Bot. 10: 41. 1902.

*Boerhaavia universitatis* Standley, Contr. U. S. Nat. Herb. 12: 380. 1909.

Erect or procumbent annual, 2–5 dm. high, much branched, the branches slender, ascending, minutely puberulent, often brown-punctate or tinged with red, the middle and upper internodes usually with viscous rings; petioles slender, 0.3–2.5 cm. long; blades of the lower leaves mostly oval or broadly oblong, rarely oval-ovate or suborbicular, the others oblong to ovate, lanceolate, or linear, 1.5–4.5 cm. long, 0.3–1.5 cm. wide, rounded or obtuse at the base, broadly rounded to long-attenuate at the apex, rather thin, glabrous or when young obscurely puberulent, entire or subsinuate, green above, paler or often white beneath, frequently brown-punctate, especially on the upper leaves; inflorescence cymose-paniculate, much branched, the branches slender, ascending, the internodes usually with viscous rings, the flowers on slender pedicels 1–3 mm. long, in few-flowered, usually simple umbels at the ends of long slender peduncles; bracts minute, lanceolate, glandular-punctate, persistent; perianth 1.5–2 mm. long, pink, often glandular-punctate; stamens 2 or 3, equaling or slightly exceeding the perianth; fruit narrowly obpyramidal, 2.5–2.7 mm. long, yellowish-green or stramineous, glabrous, truncate at the apex, 5-angulate, the angles smooth, obtuse, the narrow sulci transverse-rugulose.

TYPE LOCALITY: El Paso, Texas.

DISTRIBUTION: Dry plains and fields, western Texas to southeastern California, south to Lower California, Durango, and Coahuila.

ILLUSTRATION: M. E. Jones, Contr. West. Bot. 10: *pl.* 16.

18. *Boerhaavia lateriflora* Standley, Contr. U. S. Nat. Herb. 13: 426. 1911.

Erect or procumbent annual, 1–5 dm. high, much branched, the branches slender, greenish, minutely puberulent, slightly or not at all viscous; petioles very slender, 0.3–3 cm. long; leaf-blades broadly ovate-rhombic to ovate, oval, oblong, or lance-oblong, or the uppermost linear, 1.5–5.5 cm. long, 1–2.5 cm. wide, or those of the inflorescence only 2 mm. wide, rounded at the base, rounded to attenuate at the apex, entire or subsinuate, thin, green above, slightly paler beneath, glabrous or obscurely puberulent; inflorescence cymose-paniculate or wholly of axillary and terminal simple peduncles, the flowers sessile or short-pedicellate, in dense headlike cymes; bracts minute, lanceolate, thin, persistent, sometimes glandular-punctate; perianth pink, 2–3 mm. long, glabrous; stamens 3, exserted; fruit 2.5 mm. long, narrowly obpyramidal, truncate at the apex, glabrous, 5-angulate, the angles obtuse, slightly rugulose, the sulci broad, strongly rugulose.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Vicinity of the type locality.

19. *Boerhaavia Wrightii* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

*Boerhaavia bracteosa* S. Wats. Proc. Am. Acad. 20: 370. 1885.

Erect annual, 2–6 dm. high, much branched, the branches slender or stout, ascending, densely puberulent below and often short-villous, densely glandular-puberulent and villous above; petioles slender or stout, 0.5–2 cm. long; leaf-blades ovate, ovate-oblong, oval, narrowly oblong, or lanceolate, or the uppermost linear, 2–4.5 cm. long, 0.3–2.5 cm. wide, truncate or rounded at the base, obtuse or rounded to long-attenuate at the apex, sinuate or entire, rather

thin, green above, paler beneath, brown-punctate, puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glandular-puberulent, viscid-villous, or glandular-hirtellous, the flowers on pedicels about 1 mm. long, in dense or somewhat interrupted racemes, these with glabrous rachises; bracts about as long as the fruit, persistent, ovate-orbicular or ovate, abruptly acuminate or long-cuspidate, very thin, purplish, short-villous and ciliate; perianth pink, 1.5 mm. long; stamens 3 or 4, included; fruit broadly oblong, rounded at the apex, 2 mm. long and over 1 mm. thick, glabrous, usually 4-angulate, the angles broad, acute, smooth, the sulci broad, rugulose.

TYPE LOCALITY: Pebbly hills near El Paso [Texas or Chihuahua].

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to Nevada, and southward to Sonora.

20. *Boerhaavia Rosei* Standley, Contr. U. S. Nat. Herb. 13: 424.  
1911.

Erect annual, 5 dm. high, much branched, the branches slender, ascending or spreading, puberulent, above densely glandular-puberulent or glandular-hirtellous; petioles rather stout, 5–12 mm. long; leaf-blades ovate, ovate-oval, or oval, the uppermost often lanceolate, 1.2–2.2 cm. long, 0.4–1.2 cm. wide, rounded at the base, obtuse to very acute at the apex, entire or subsinuate, thin, green above, paler beneath, glabrous or sparsely puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, the internodes usually viscous, the flowers on stout pedicels 1 mm. long or shorter, in long slender interrupted racemes; bracts minute, thin, lanceolate, ciliolate, deciduous; perianth pink, 1 mm. long, glabrous; stamens included; fruit narrowly obpyramidal, 2.5 mm. long, truncate at the apex, glabrous, green, 5-angulate, the angles smooth, acute, the sulci broad, open, smooth or obscurely rugulose.

TYPE LOCALITY: In sandy soil along the Río Fuerte near Fuerte, Sinaloa.

DISTRIBUTION: Known only from the type locality.

21. *Boerhaavia alamosana* Rose, Contr. U. S. Nat. Herb. 1: 110.  
1891.

Erect annual, 3–5 dm. high, much branched, the branches slender, ascending, puberulent and sparsely hirtellous; petioles slender 3–8 mm. long; leaf-blades lanceolate or linear-lanceolate, 1.2–3.3 cm. long, 3–5 mm. wide, rounded at the base, acute to long-attenuate at the apex, entire or subsinuate, green above, pale beneath, brown-punctate, puberulent; inflorescence cymose-paniculate, much branched, the branches slender, ascending, glabrous, the flowers on pedicels 1–2 mm. long, in short, slender, remotely flowered racemes; bracts lanceolate, thin, ciliolate, brown-punctate, shorter than the flowers, deciduous; perianth 3 mm. long, white, glabrous or puberulent; stamens 4, exserted; fruit obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, rounded, smooth, the sulci narrowly linear, nearly closed, smooth.

TYPE LOCALITY: Hillsides about Alamos, Sonora.

DISTRIBUTION: Known only from the type locality.

22. *Boerhaavia Coulteri* (Hook. f.) S. Wats. Proc. Am. Acad.  
24: 70. 1889.

*Senkenbergia Coulteri* Hook. f.; Benth. & Hook. Gen. Pl. 3: 6, hyponym. 1880.

*Boerhaavia spicata* Palmeri S. Wats. Proc. Am. Acad. 24: 70. 1889.

*Boerhaavia Watsoni* Standley, Contr. U. S. Nat. Herb. 12: 384. 1909.

Erect or decumbent annual, 2–8 dm. high, much branched, the branches slender, ascending, green or stramineous, puberulent, often sparsely villous or hirtellous above; petioles slender, 0.5–2 cm. long; leaf-blades broadly ovate-rhombic, oval, oblong, deltoid-ovate, ovate, or lanceolate, 1.5–5 cm. long, 0.5–2.2 cm. wide, rounded at the base, rounded to very acute at the apex, thin, entire or sinuate, green above, pale beneath, glabrous or sparsely puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, usually with viscid internodes, the flowers on pedicels 1 mm. long or shorter, in slender interrupted



racemes; bracts usually shorter than the ovary, lanceolate or ovate, thin, brown-punctate, obscurely ciliolate; perianth 1–1.5 mm. long, pink or white, glabrous; stamens 1 or 2, included; fruit narrowly obovoid, 2.5–3 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, obtuse, smooth, the sulci narrowly linear, closed, smooth.

TYPE LOCALITY: Mexico.

DISTRIBUTION: In dry, sandy soil, Arizona and southeastern California to Lower California and Sonora.

**23. *Boerhaavia Xanti* S. Wats. Proc. Am. Acad. 24: 69. 1889.**

*Boerhaavia fallax* Standley, Contr. U. S. Nat. Herb. 13: 424. 1911.

Erect or decumbent annual, 2–4 dm. high, much branched, the branches slender, stramineous or light-green, puberulent and villous or hirtellous below; petioles slender, 0.5–2.5 cm. long; leaf-blades ovate-rhombic, oval, oblong, oblong-ovate, narrowly oblong, or lanceolate, 2–5 cm. long, 0.5–3 cm. wide, subcordate to obtuse at the base, rounded to attenuate at the apex, entire or usually sinuate, thin, green above, paler beneath, often brown-punctate, glabrous or puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, often with viscous internodes, the flowers on pedicels 1 mm. long, in short, dense or interrupted racemes; bracts small, lanceolate or ovate, deciduous, thin, often ciliolate, shorter than the flowers; perianth pink, 3 mm. long, glabrous; stamens 3 or 4, exserted; fruit broadly obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, acute, smooth, the sulci broad, transverse-rugulose.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Southern Lower California and western Sonora.

**24. *Boerhaavia Torreyana* (S. Wats.) Standley, Contr. U. S. Nat. Herb. 12: 385. 1909.**

*Boerhaavia spicata* Torr. Bot. Mex. Bound. Surv. 171. 1859. Not *B. spicata* Choisy, 1849.

*Boerhaavia spicata Torreyana* S. Wats. Proc. Am. Acad. 24: 70. 1889.

Erect or procumbent annual, 2–6 dm. high, much branched, the branches slender or stout, puberulent below and sometimes sparsely glandular-hirtellous, above puberulent and hirtellous, sometimes viscid; petioles slender, 0.5–2.5 cm. long; leaf-blades deltoid-ovate, oval, oblong, rhombic-ovate, or ovate, or the uppermost narrowly lanceolate, 1.7–4.5 cm. long, 0.4–2.5 cm. wide, truncate to obtuse at the base, rounded to very acute at the apex, entire or usually sinuate, green above, paler beneath, usually brown-punctate, puberulent or glabrate; inflorescence cymose-paniculate, much branched, the branches slender, glabrous but mostly with viscous internodes, the flowers on slender pedicels 1–2 mm. long, in slender, remotely flowered racemes; bracts small, deciduous, usually lanceolate, thin, brown-punctate, ciliolate, commonly shorter than the ovary at anthesis; perianth pink, glabrous or puberulent, 1–1.5 mm. long; stamens 1 or 2, included; fruit narrowly obovoid, 2.5 mm. long, rounded at the apex, acuminate at the base, glabrous, stramineous, 5-angulate, the angles thin, acute, often rugulose, the sulci broad and open, rugulose.

TYPE LOCALITY: Not definitely stated.

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to Arizona, south to Coahuila.

**25. *Boerhaavia spicata* Choisy, in DC. Prodr. 13<sup>2</sup>: 456. 1849.**

*Boerhaavia Palmeri* S. Wats. Proc. Am. Acad. 24: 69. 1889. Not *B. Palmeri* S. Wats. 1883.

Erect or procumbent annual, 2–6 dm. high, much branched, the branches stout, usually tinged with red, densely viscid-puberulent, often villous above; petioles stout, 0.5–3.5 cm. long; leaf-blades ovate or lanceolate, or sometimes oblong, ovate-deltoid, or narrowly lanceolate, 1–4.5 cm. long, 0.4–2 cm. wide, truncate to obtuse at the base, obtuse to attenuate at the apex, entire or often deeply sinuate, rather thin, green above, pale beneath, viscid-puberulent or sparsely short-villous, usually brown-punctate; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, with viscous internodes, the flowers on pedicels 1–2 mm. long, in short dense racemes; bracts broadly ovate, pink, thin, often as long as the flowers, ciliate, deciduous; perianth 1–1.5 mm. long, pink, puberulent or glabrous; stamens



1 or 2, included; fruit obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles thick, acute, smooth, the sulci broad, open, rugose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: In dry, sandy soil, southern Arizona to Chihuahua and Sinaloa.

**17. CYPHOMERIS** Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Lindenia* Mart. & Gal. Bull. Acad. Brux. 10<sup>1</sup>: 357. 1843. Not *Lindenia* Benth. 1842.

*Tinantia* Mart. & Gal. Bull. Acad. Brux. 11<sup>1</sup>: 240. 1844. Not *Tinantia* Scheidw. 1839.

*Senkenbergia* Schauer, Linnaea 19: 711. 1847. Not *Senkenbergia* Gaertn. Mey. & Scherb. 1800.

Erect or ascending perennial herbs, suffrutescent at the base, more or less pubescent, much branched, the upper internodes each with a glutinous area along the middle. Leaves opposite, those of a pair subequal, petiolate, the blades broad or narrow, succulent, entire or sinuate. Flowers perfect, in elongate, spikelike, terminal and axillary racemes, pedicellate, each pedicel subtended by a narrow caducous bract; perianth broadly tubular-funnelform, deep bright-red, the tube very short, slightly curved, constricted above the ovary, the limb somewhat oblique, shallowly 5-lobed, induplicate-plicate. Stamens 5; filaments capillary, exserted, unequal, connate at the base; anthers didymous. Ovary fusiform, asymmetric; style filiform, exserted; stigma capitate. Anthocarp clavate, stipitate, gibbous, pendent or refracted, finely striate vertically, glabrous. Seed with a thin testa adherent to the pericarp; embryo uncinat, the broad cotyledons enclosing the farinaceous endosperm, the radicle elongate, descending.

Type species, *Lindenia gypsophiloides* Mart. & Gal.

Fruit 10–12 mm. long; leaf-blades glabrous, or sparsely puberulent when young, the upper most usually linear or nearly so.

Fruit about 7 mm. long; leaf-blades permanently and densely puberulent, the upper ones nearly as broad as the lower.

1. *C. gypsophiloides*.

2. *C. crassifolia*.

**1. Cyphomeris gypsophiloides** (Mart. & Gal.) Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Lindenia gypsophiloides* Mart. & Gal. Bull. Acad. Brux. 10<sup>1</sup>: 358. 1843.

*Tinantia gypsophiloides* Mart. & Gal. Bull. Acad. Brux. 11<sup>1</sup>: 240. 1844.

*Senkenbergia annulata* Schauer, Linnaea 19: 711. 1847.

*Boerhaavia gibbosa* Pavon; Choisy, in DC. Prodr. 13<sup>2</sup>: 457. 1849.

*Senkenbergia gypsophiloides* Benth. & Hook. Gen. Pl. 3: 5. 1880.

*Boerhaavia gypsophiloides* Coult. Contr. U. S. Nat. Herb. 2: 354. 1894.

Plants erect or ascending, 3–10 dm. high, suffrutescent at the base, much branched, the branches slender, glaucous, glabrous, or rarely obscurely puberulent below; petioles slender, 0.5–2.5 cm. long; leaf-blades narrowly deltoid, lanceolate, deltoid-oblong, or ovate-deltoid, the upper ones usually linear, 2.5–7 cm. long, 0.3–3 cm. wide, subcordate to acute at the base, gradually narrowed to an acute or obtuse apex, entire or rarely slightly sinuate, green above, glaucescent beneath, glabrous, or when young sparsely and minutely puberulent; racemes slender, 5–16 cm. long, the flowers remote, on pedicels 1 mm. long; bracts lanceolate or linear, 4–7 mm. long, glabrous; perianth 7–9 mm. long, 9 mm. broad, glabrous; stamens long-exserted; fruit 10–12 mm. long, slender-stipitate, 2–2.5 mm. thick; seed obovoid, about 4 mm. long, rounded at the apex, acuminate at the base, brown.

TYPE LOCALITY: Plains near Tehuacán, Puebla.

DISTRIBUTION: Dry, rocky slopes, western Texas and southern New Mexico, southward to Nuevo León and Puebla.

**2. Cyphomeris crassifolia** Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Senkenbergia crassifolia* Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

Plants 6–10 dm. high, suffruticose below, much branched, the branches slender, pale-green, finely and sparsely puberulent, the branches of the inflorescence glabrous; petioles 0.4–2.5 cm. long; leaf-blades rhombic, broadly oblong, or rhombic-ovate, 1.5–3 cm. long, 1–2



cm. wide truncate to rounded or broadly cuneate at the base, obtuse or acutish at the apex, coarsely sinuate-lobate, green above, paler beneath, densely and finely puberulent; racemes 5–10 cm. long, the flowers on pedicels 1 mm. long; bracts lance-linear, 4–5 mm. long, green, glabrous; perianth 6–7 mm. long, glabrous, the tube very short, the limb 7 mm. broad; stamens long-exserted; fruit 7 mm. long, short-stipitate, 2 mm. thick in the widest part.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Nuevo León and Coahuila.

**18. COMMICARPUS** Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

Perennial herbs or shrubs, pubescent or glabrous, usually decumbent or reclining, the stems much branched. Leaves opposite, those of a pair subequal, petiolate, the blades broad, more or less succulent, entire or sinuate. Flowers perfect, umbellate or verticillate, pedicellate, each pedicel bracteate, the bracts forming an involucre; perianth funnelform or campanulate, corolla-like, white or green, usually with a distinct tube, constricted above the ovary, the limb shallowly 5-lobed, induplicate-plicate. Stamens 2–5; filaments exserted, capillary, unequal, connate at the base; anthers didymous. Ovary stipitate, attenuate to a filiform style; stigma peltate. Anthocarp cylindric-fusiform, symmetric, finely costate vertically, pubescent or glabrous, bearing numerous verrucose glands. Seed with a thin testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the scanty endosperm; radicle slender, elongate, descending.

Type species, *Boerhaavia scandens* L.

Perianth 3 mm. long and broad, glabrous or obscurely puberulent; glands of the fruit irregularly scattered.

1. *C. scandens*.

Perianth 7–8 mm. long, 10 mm. broad, short-villous or hirtellous; glands of the fruit grouped in transverse bands.

2. *C. Brandegei*.

**1. Commicarpus scandens** (L.) Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

*Boerhaavia scandens* L. Sp. Pl. 3. 1753.

*Boerhaavia Grahami* A. Gray, Am. Jour. Sci. II. 15: 323. 1853.

Plants decumbent or usually clambering over shrubs, fruticose or suffrutescent below, much branched, the branches slender, pale-green, glabrous, or obscurely puberulent about the nodes; petioles slender, 1–2 cm. long; leaf-blades broadly cordate-ovate to ovate-deltoid or rarely rhombic-orbicular, 1.5–6.5 cm. long, 1–4.5 cm. wide, deeply cordate to truncate at the base and unequal, attenuate to acute or rarely rounded at the apex, rather succulent, bright-green, slightly paler beneath, glabrous, or when young obscurely puberulent or scaberulous; flowers umbellate, the peduncles slender, 2–4.5 cm. long, the pedicels slender, 5–10 mm. long, glabrous; bracts lanceolate or oblong, 2–3 mm. long, green, ciliolate, caducous; perianth greenish-yellow, 3–4 mm. long and broad, glabrous or rarely obscurely puberulent; stamens 2 or rarely 3, exserted; fruit about 1 cm. long and 2 mm. in diameter, narrowly clavate-cylindric, glabrous, bearing few or numerous glands irregularly scattered along the costae.

TYPE LOCALITY: Santiago de la Vega [Spanish Town], Jamaica.

DISTRIBUTION: Western Texas to southeastern Arizona and Lower California, and southward nearly throughout Mexico; nearly throughout the West Indies; also from Colombia and Venezuela to Peru.

ILLUSTRATIONS: Jacq. Hort. Vindob. 1: pl. 4; Lam. Tab. Encyc. pl. 4; Meerb. Pl. Rar. pl. 21; Gaertn. Fruct. pl. 127.

**2. Commicarpus Brandegei** Standley, Contr. U. S. Nat. Herb. 12: 374. 1909.

*Boerhaavia elongata* Brand. Proc. Calif. Acad. II. 2: 199. 1889. Not *B. elongata* Salisb. 1796.  
*Commicarpus Brandegei glabrior* Standley, Contr. U. S. Nat. Herb. 12: 374. 1900.

Plants much branched, 2 meters long or more, prostrate or clambering over shrubs, the branches slender, glaucescent, often sparsely short-villous when young but soon glabrate; petioles slender, 5–15 mm. long; leaf-blades broadly cordate-ovate or ovate-deltoid, 2–5 cm.

long, 1.5–3 cm. wide, cordate at the base and slightly unequal, acute or attenuate at the apex, minutely puberulent when young but soon glabrate; flowers in 3–6-flowered umbels on long slender peduncles, the pedicels 1–2 cm. long, short-villous or rarely glabrate; bracts linear, 2–3 mm. long, green, short-villous, caducous; perianth 7–10 mm. long, 10–15 mm. broad, white, short-villous outside, at least below; stamens 2, exserted; fruit narrowly clavate-oblong, 5–10 mm. long, 2 mm. thick, dark-green, glabrous, bearing numerous glands arranged in 3 or 4 transverse bands.

TYPE LOCALITY: San Pablo, Lower California.

DISTRIBUTION: Southern Lower California.

### 19. *ANULOCAULIS* Standley, Contr. U. S. Nat. Herb. 12: 374. 1909.

Tall erect perennial herbs, more or less pubescent, branched, the internodes usually each with a viscid ring. Leaves opposite, petiolate, few, borne near the base of the stem, the blades broad, coriaceous, glandular-dentate or denticulate. Flowers perfect, bracteate, umbellate or in axillary glomerules or racemose, the inflorescence ample, much branched, the bracts small, scarious or coriaceous; perianth funnellform, the tube elongate, constricted above the ovary, the limb campanulate or subrotate, 5-lobed, induplicate-plicate. Stamens 3 or 5, exserted; filaments unequal, filiform, connate at the base; anthers didymous. Style filiform, the stigma peltate. Anthocarp coriaceous, biturbinate, 10-striate, glabrous, in one species (probably in all) developing at maturity a broad median horizontal wing. Seed with its thin testa adherent to the pericarp; embryo uncinate, the broad cotyledons enclosing the copious endosperm; radicle elongate, descending.

Type species, *Boerhaavia eriosolena* A. Gray.

Perianth glabrous, 2.5–3 cm. long; leaf-blades glabrous or nearly so. 1. *A. leiosolenus*.

Perianth villous, 8–10 mm. long; leaf-blades long-villous beneath, at least when young.

Flowers mostly in sessile axillary clusters; perianth abruptly expanded into a subrotate limb. 2. *A. eriosolenus*.

Flowers in pedunculate terminal umbels; perianth gradually dilated into a campanulate limb. 3. *A. annulatus*.

#### 1. *Anulocaulis leiosolenus* (Torr.) Standley, Contr. U. S. Nat. Herb. 12: 375. 1909.

*Boerhaavia leiosolena* Torr. Bot. Mex. Bound. Surv. 172. 1859.

*Acleisanthes nummularia* M. E. Jones, Contr. West. Bot. 10: 43. 1902.

*Boerhaavia nummularia* M. E. Jones; Prain, Ind. Kew. Suppl. 4: 27. 1913.

Plants erect, 6–10 dm. high, sparsely branched below, the branches stout, glaucous, glabrous; leaves 1 or 2 pairs at the base of the stem, the petioles stout, 2–11 cm. long, the blades reniform to broadly oval, rhombic-orbicular, or ovate-oval, 3.5–15 cm. long, 3.5–12.5 cm. wide, deeply cordate to truncate at the base, broadly rounded at the apex, rather coarsely sinuate, thick-coriaceous, yellowish-green on the upper surface and when young tomentulose, beneath glaucescent and tomentulose or villous when young but early glabrate and gland-dotted; inflorescence much branched, the branches stout, naked, the flowers fasciculate or in dense spikes, short-pedicellate; bracts minute, ovate, coriaceous, glabrous; perianth yellowish-green, 2.5–3 cm. long, glabrous, gradually dilated above into a narrow limb; stamens 5, short-exserted, fruit biturbinate, 5–6 mm. long, glaucous, in age developing at the middle a rigid horizontal wing 6–7 mm. in diameter; seed biturbinate, 3 mm. long, pale-brown.

TYPE LOCALITY: In gypseous soil, Great Canyon of the Rio Grande, 70 miles below El Paso, Texas.

DISTRIBUTION: In strongly alkaline soil, western Texas to Arizona and Nevada.

#### 2. *Anulocaulis eriosolenus* (A. Gray) Standley, Contr. U. S. Nat. Herb. 12: 375. 1909.

*Boerhaavia eriosolena* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

Plants erect, 2–10 dm. high, sparsely branched below, the branches very stout, glabrous; petioles stout, 1–4 cm. long; leaf-blades orbicular-oval to ovate-oval, 2.2–10 cm. long, 2–7 cm.



wide, cordate or subcordate at the base, rounded at the apex, coriaceous, glandular-denticulate, sparsely scabrous on the upper surface with stout conic hairs having dark glandular bases, similarly pubescent beneath with longer hairs, glabrate in age; inflorescence paniculately much branched, the branches slender, naked, the flowers in axillary and terminal few-flowered clusters, on slender pedicels 2–4 mm. long; bracts ovate-oblong or lance-oblong, 2–3 mm. long, acuminate, scarious, glabrous, usually ciliolate; perianth 1 cm. long, the tube slender, long-villous, very abruptly expanded into a nearly rotate limb 1 cm. broad; stamens 5, short-exserted; fruit turbinate, 5 mm. long, conic above, glabrous.

TYPE LOCALITY: Valley near Azufra, Coahuila.

DISTRIBUTION: Western Texas and Coahuila.

### 3. *Anulocaulis annulatus* (Coville) Standley, Contr. U. S. Nat.

Herb. 12: 375. 1909.

*Boerhaavia annulata* Coville, Contr. U. S. Nat. Herb. 4: 177. 1893.

Plants erect from a decumbent base, 5–10 dm. high, sparsely branched below, loosely paniculate above, the branches stout, glaucescent, at least below, glabrous except at the villous nodes; petioles stout, 2–4 cm. long; leaf-blades broadly oval to ovate-oval or ovate-deltoid, 3–8 cm. long, 2–6 cm. wide, subcordate or rounded at the base and subequal, rounded at the apex or rarely only obtuse, coriaceous, shallowly and irregularly repand-dentate, yellowish-green above and hirsute with slender hairs having dark enlarged glandular bases, paler beneath and densely hirsute with similar hairs; inflorescence nearly naked, the branches slender, the flowers in dense many-flowered headlike long-pedunculate umbels; bracts short, lanceolate, hirsute, the hairs with glandular bases; perianth 8 mm. long, greenish, the tube stout, long-villous, gradually dilated into a campanulate limb; stamens 3, short-exserted; fruit biturbinate, 5 mm. long, glabrous.

TYPE LOCALITY: Furnace Creek Canyon, Funeral Mountains, Inyo County, California.

DISTRIBUTION: Inyo County, California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 4: *pl. 18*.

## 20. *ALLIONIA* L. Syst. Nat. ed. 10. 890. 1759.

*Vitmania* Turra; Cav. Ic. 3: 53. 1794. Not *Vitmannia* Vahl, 1794.

*Oxybaphus* L'Hér.; Willd. Sp. Pl. 1: 185. 1797.

*Calyxhymenia* Ortega, Dec. 5. 1797.

*Calymenia* Pers. Syn. Pl. 1: 36. 1805.

Perennial plants, herbaceous or rarely suffruticose, erect or procumbent, viscid-pubescent or glabrous, usually branched, the branches somewhat swollen at the nodes. Leaves opposite, sessile or petiolate, the blades entire or undulate, often asymmetric. Flowers perfect, involucre, the involucre 1–3-flowered, equally or unequally 5-lobed, in fruit more or less accrescent, often nearly rotate in age and reticulate-veined; perianth campanulate or broadly short-funnelform, usually oblique, the tube usually very short, constricted above the ovary, the limb 5-lobed, the lobes induplicate-valvate, emarginate, the perianth deciduous after anthesis. Stamens 3–5; filaments capillary, unequal, circinnate, short-connate at the base, usually exserted; anthers didymous. Ovary ovoid or subglobose; style filiform; stigma long-papillose. Anthocarp obovoid, usually 5-angulate or 5-sulcate, almost terete, rugose or tuberculate, or the angles smooth, constricted at the base, glabrous or pubescent, mucilaginous when wet. Seed adherent to the pericarp; embryo uncinat, the cotyledons enclosing the copious endosperm; radicle exterior, elongate, descending.

Type species, *Allionia violacea* L.

Fruit glabrous.

Angles of the fruit covered with coarse, distinct tubercles.

Stems densely viscid-pilose below.

Stems glabrous up to the inflorescence.

Involucres in fruit 6–10 mm. long; blades of the lower leaves usually broadly cordate-deltoid, twice as long as broad or shorter.

Involucres in fruit 4–6 mm. long; blades of the lower leaves elongate deltoid-lanceolate, three times as long as broad or longer.

1. *A. viscosa*.

2. *A. corymbosa*.

3. *A. microchlamydea*.

Angles of the fruit continuous, smooth.

Leaf-blades linear, 2-7 mm. wide; stems glabrous.

Leaf-blades lanceolate or broader, 10-40 mm. wide.

Stems glabrous.

Stems densely short-pilose.

Fruit more or less pubescent, sometimes with only sparse pubescence of short hairs.

Leaf-blades sessile or nearly so, or sometimes gradually attenuate to a short, stout petiole, the blade not sharply differentiated from the petiole.

Leaf-blades linear or lance-linear.

Perianth deep bright-red, about 4 times as long as the involucre, much longer than broad.

Perianth pink or purplish-red, about twice as long as the involucre, usually broader than long.

Stems densely hirsute or long-villous, at least at the base, glaucous.

Stems glabrous below or nearly so.

Stems glaucous; leaf-blades sessile or gradually narrowed to a short, stout or marginate petiole, glaucous or glaucescent beneath.

Stems green; leaf-blades, at least the lower ones, subabruptly contracted into a slender petiole, bright-green.

Leaf-blades lanceolate or broader.

Stems densely hirsute, at least near the base, the middle nodes sometimes glabrate but the nodes always hirsute.

Stems puberulent or glabrate, or sometimes pilose or hirsute above but not near the base.

Stems densely puberulent throughout; leaf-blades ovate to ovate-deltoid.

Stems glabrate below or puberulent only in lines; leaf-blades mostly lanceolate.

Angles of the fruit strongly tuberculate or composed of distinct tubercles.

Angles of the fruit continuous, smooth or nearly so.

Leaf-blades usually broadly rounded at the base or even subcordate, those of the lower leaves sometimes acute at the base; branches of the inflorescence mostly opposite.

Leaf-blades acute or acuminate at the base; branches of the inflorescence mostly alternate.

Leaf-blades, at least most of them, on long slender petioles, the blades usually obtuse to cordate at the base and sharply differentiated from the petioles.

Fruit prominently 5-angulate, the angles smooth or tuberculate; stems usually stout, erect or decumbent, and sparsely branched; involucre much accrescent in fruit, the lobes equal or nearly so.

Involucres at anthesis usually glabrous except at the base, there short-pilose or puberulent, the lobes glabrous, in fruit usually 15-20 mm. broad.

Involucres at anthesis densely viscid-pilose outside, in fruit usually less than 15 mm. broad.

Stems densely puberulent, pilose, or hirsute below, over the whole surface, with stiff hairs.

Leaf-blades usually twice as long as broad, ovate or ovate-oblong, and obtuse at the base; plants tall, erect, simple or sparsely branched below.

Leaf-blades less than twice as long as broad, mostly ovate-deltoid or deltoid, usually truncate or subcordate at the base; plants low, spreading, much branched below, the branches mostly divergent.

Stems puberulent or short-pilose below with weak, soft hairs.

Stems hirsute below with long, stiff hairs.

Stems glabrous below or puberulent in lines, very rarely pilose with weak, soft, viscid hairs.

Plants suffruticose.

Plants herbaceous.

Blades of the upper leaves about as broad as long, rounded or very obtuse at the apex; involucre in fruit 10-12 mm. long.

Blades of the upper leaves usually twice as long as broad or longer, lance-oblong to linear, commonly long-acuminate to attenuate at the apex; involucre in fruit rarely over 8 mm. long.

Lobes of the involucre oval-oblong, longer than the tube, all or most of them rounded at the apex, usually pilose with black hairs.

4. *A. glabra*.

5. *A. exaltata*.

6. *A. Carletoni*.

7. *A. coccinea*.

8. *A. gausapoides*.

9. *A. linearis*.

10. *A. decipiens*.

11. *A. hirsuta*.

12. *A. pauciflora*.

13. *A. albida*.

14. *A. lanceolata*.

15. *A. aggregata*.

19. *A. nyctaginea*.

16. *A. coahuilensis*.

17. *A. pumila*.

18. *A. rotundifolia*.

21. *A. suffruticosa*.

20. *A. Grayana*.



- Leaf-blades linear or lance-linear, acute or attenuate at the base. 10. *A. decipiens*.  
 Leaf-blades mostly elongate-deltoid or deltoid, sometimes rather broadly lanceolate, obtuse to cordate at the base. 22. *A. comata*.  
 Lobes of the involucre broadly ovate or ovate-orbicular, usually shorter than the tube, acute or acutish at the apex, at least in fruit, pilose with white or fulvous hairs.  
 Leaf-blades acute or acutish at the base, lanceolate or broadly lanceolate. 15. *A. aggregata*.  
 Leaf-blades rounded to cordate at the base, ovate-cordate to lance-deltoid.  
 Leaf-blades deeply cordate at the base, often shorter than the petioles, these puberulent or short-pilose with fulvous hairs; fruit 5 mm. long. 23. *A. longipes*.  
 Leaf-blades rounded to subcordate at the base, much longer than the petioles, these long-pilose with white hairs; fruit 3.5–4 mm. long. 24. *A. ciliata*.  
 Fruit terete at maturity, irregularly and sparsely tuberculate; stems slender, usually procumbent, much branched; involucre only slightly accrescent in fruit, the lobes very unequal. 25. *A. violacea*.

### 1. *Allionia viscosa* (Cav.) Kuntze, Rev. Gen. 533. 1891.

*Mirabilis viscosa* Cav. Ic. 1: 13. 1791.  
*Nyctago parviflora* Salisb. Prodr. 57. 1796.  
*Calyxhymenia viscosa* R. & P. Fl. Per. 1: 46. 1798.  
*Calymenia viscosa* Pers. Syn. Pl. 1: 36. 1805.  
*Vitmania viscosa* Turra; Steud. Nom. 140, as synonym. 1821.  
*Oxybaphus viscosus* L'Hér.; Choisy, in DC. Prodr. 13<sup>2</sup>: 430. 1849.  
*Oxybaphus Cervantesii* S. Wats. Proc. Am. Acad. 21: 436. 1886. Not *O. Cervantesii* Sweet, 1825.  
*Allionia rotata* Standley, Contr. U. S. Nat. Herb. 12: 347. 1909.  
*Oxybaphus rotatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect, 4–15 dm. high, stout, sparsely branched or simple below the inflorescence, green, densely short-pilose with viscid hairs; petioles slender, 1–6.5 cm. long, densely short-pilose; leaf-blades broadly cordate-ovate to ovate-deltoid, 2.5–10 cm. long, 1.5–9 cm. wide, usually cordate at the base but sometimes truncate, abruptly short-decurrent, acute or attenuate at the apex, entire or subsinuate, thin, bright-green, sparsely viscid-puberulent or glabrate on the upper surface, short-pilose or puberulent beneath, the leaves of the inflorescence reduced and bractlike, often very numerous, sessile or short-petiolate, the blades ovate to suborbicular; inflorescence ample, paniculate, much branched, the branches opposite, ascending, stout or slender, densely viscid-pilose with short fulvous hairs; involucre numerous, slender-pedunculate, at anthesis 3–5 mm. long, in fruit 15–25 mm. broad, densely viscid-pilose, the lobes broadly rounded; flowers solitary or rarely 2 or 3 in each involucre, the perianth 8–20 mm. long, purplish-red, sparsely pilose outside, the limb 15–25 mm. broad; stamens 3, long-exserted; fruit obovoid, 5 mm. long, brownish-gray, glabrous, densely covered with large coarse rounded tubercles; seed oval-obovoid, 3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Huanuco, Peru.

DISTRIBUTION: Chihuahua to Tamaulipas and Oaxaca; Peru.

ILLUSTRATIONS: Cav. Ic. 1: *pl.* 19; Schnizl. Ic. *pl.* 104; Bot. Mag. *pl.* 434; Dict. Sci. Nat. *pl.* 22.

### 2. *Allionia corymbosa* (Cav.) Kuntze, Rev. Gen. 533. 1891.

*Mirabilis corymbosa* Cav. Ic. 4: 55. 1797.  
*Calyxhymenia glabrifolia* Ortega, Dec. 5. 1797.  
*Calymenia corymbosa* Pers. Syn. Pl. 1: 37. 1805.  
*Oxybaphus glabrifolius* Vahl, Enum. Pl. 2: 40. 1806.  
*Allionia corymbosa texensis* Coult. Contr. U. S. Nat. Herb. 2: 351. 1894.  
*Allionia texensis* Small, Fl. SE. U. S. 406. 1903.  
*Oxybaphus texensis* Weatherby, Proc. Am. Acad. 45: 425. 1910.  
*Allionia cardiophylla* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.  
*Oxybaphus cardiophyllus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect or ascending, 3–10 dm. high, stout, simple or sparsely branched below, rarely suffrutescent, glaucous or glaucescent, glabrous or bifariously puberulent, usually puberulent or short-pilose at the nodes, the internodes elongate; petioles slender, 0.5–6 cm.

long, glabrous; leaf-blades broadly cordate-ovate to elongate ovate-deltoid, 2–8 cm. long, 1–5.5 cm. wide, deeply cordate to truncate at the base and usually short-decurrent, obtuse or acute at the apex, entire or subsinuate, thick and succulent, green on the upper surface, often glaucous beneath, glabrous or obscurely puberulent; inflorescence cymose-paniculate, usually much branched, the branches slender, viscid-pilose with short fulvous hairs, the bracts few and very small, the involucre usually numerous, slender-pedunculate, viscid-pilose, about 4 mm. long at anthesis, 6–10 mm. long in fruit, the lobes short, rounded-oval; flowers usually solitary in the involucre, rarely 2 or 3, the perianth sparsely pilose, 6–10 mm. long, the limb 10–12 mm. broad; stamens 3, exserted; fruit broadly obovoid, 3.5 mm. long, dark-grayish, glabrous, densely covered with short rounded tubercles; seed oval-obovoid, 2.5 mm. long, pale-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southwestern Texas and Coahuila to Hidalgo and Oaxaca.

ILLUSTRATIONS: Cav. Ic. *pl.* 379; Ortega, Dec. *pl.* 1.

### 3. *Allionia microchlamydea* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

Stems mostly solitary, erect, 4–8 dm. high, simple or sparsely branched below the inflorescence, slender, glaucous below and glabrous, the internodes elongate; petioles slender, 0.5–3.5 cm. long, glabrous; leaf-blades narrowly deltoid-lanceolate or lance-deltoid, 3–7 cm. long, 0.6–1.5 cm. wide, obtuse or truncate at the base and abruptly short-decurrent, gradually narrowed to the obtuse apex, entire or sinuate-dentate, thick and succulent, green on the upper surface, glaucous or glaucescent beneath, glabrous; inflorescence cymose-paniculate, much branched, the branches slender, alternate, sparsely or densely viscid-pilose, the bracts minute, the involucre numerous, slender-pedunculate, about 2.5 mm. long at anthesis, 4–6 mm. long in fruit, viscid-pilose, the lobes rounded-oval; flowers solitary in the perianth; fruit broadly obovoid, 2.5–3 mm. long, dark-gray, glabrous, densely covered with coarse rounded tubercles; seed oval-obovoid, 2 mm. long, pale yellowish-brown.

TYPE LOCALITY: In rocky soil near Ixmiquilpán, Hidalgo.

DISTRIBUTION: Stony hillsides, Querétaro and Hidalgo.

### 4. *Allionia glabra* (S. Wats.) Kuntze, Rev. Gen. 533. 1891.

*Oxybaphus glaber* S. Wats. Am. Nat. 7: 301. 1873.

*Oxybaphus glaber recedens* Weatherby, Proc. Am. Acad. 45: 425. 1910.

*Allionia glabra recedens* Standley, Contr. U. S. Nat. Herb. 13: 406. 1911.

Stems few or solitary, erect, 8–15 dm. high, usually simple up to the inflorescence or with a few sterile branches below, stout, glaucous or glaucescent, glabrous; leaves distant, or crowded below, sessile, the blades linear, 5–12 cm. long, 2–7 mm. wide, long-attenuate to the base, gradually narrowed to the obtuse or acute apex, entire, thick and succulent, glaucous beneath, glabrous; inflorescence a loose terminal panicle 1–4 dm. long, much branched, the branches very slender, opposite, glabrous or sparsely short-pilose with viscid hairs; involucre slender-pedunculate, at anthesis about 3.5 mm. long, in age 12–15 mm. broad, viscid-pilose or glabrous and ciliate, shallowly lobed, the lobes ovate-orbicular, rounded at the apex; flowers usually solitary, sometimes 2, in the involucre, mostly cleistogamous, the perianth about 7 mm. long, white or pale-pink, glabrous; stamens 5, short-exserted; anthocarp obovoid, about 5 mm. long, olivaceous, glabrous, the angles acute, narrow, smooth, the sides obtusely short-tuberculate or rugose; seed broadly obovoid, 3 mm. long, pale-brown.

TYPE LOCALITY: Kanab, Utah.

DISTRIBUTION: In dry soil, southeastern Utah to Chihuahua, western Texas, and Kansas.

### 5. *Allionia exaltata* Standley, Contr. U. S. Nat. Herb. 12: 355. 1909.

*Oxybaphus exaltatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary from a stout woody root, erect, about 15 dm. high, stout, glabrous, glaucescent below, simple or sparsely branched below the inflorescence, the internodes elongate;



petioles stout, 3–10 mm. long, glabrous; leaf-blades elliptic-lanceolate or lanceolate, 4.5–7 cm. long, 0.7–2 cm. wide, acute at the base and apex, entire or subsinuate, thick and succulent, often glaucous or glaucescent beneath, glabrous; inflorescence a large open panicle, much branched, the branches slender, ascending, glabrous or very sparsely short-pilose with viscid hairs, the peduncles slender, elongate, short-pilose or glabrous, the involucre 3–4 mm. long at anthesis, 10–12 mm. long in fruit, sparsely short-pilose or glabrous, the lobes short, rounded; flowers usually 3 in each involucre; fruit obovoid, 4.5 mm. long, brownish, glabrous, the angles acute, narrow, smooth, the sides transverse-rugulose; seed obovoid, pale yellowish-brown.

TYPE LOCALITY: Cimarron Valley, Cherokee Outlet, Oklahoma.

DISTRIBUTION: Oklahoma.

6. *Allionia Carletoni* Standley, Contr. U. S. Nat. Herb. 12: 355.  
1909.

*Oxybaphus hirsutus* Holz. Contr. U. S. Nat. Herb. 1: 213. 1892. Not *O. hirsutus* Sweet, 1825.  
*Oxybaphus nyctagineus pilosus* Holz. Contr. U. S. Nat. Herb. 1: 213. 1892. Not *O. nyctagineus pilosus* A. Gray, 1859.

*Oxybaphus Carletoni* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect, 6–12 dm. high, stout, glaucous below, simple or sparsely branched below the inflorescence, densely viscid-pilose with short slender fulvous hairs; leaves sessile or subsessile, the very stout broad petioles 4 mm. long or shorter, the blades broadly deltoid-ovate to ovate or ovate-oblong, 4–8 cm. long and 1–4 cm. wide, or larger, subcordate to obtuse at the base, narrowed to the obtuse or acute apex, entire or subsinuate, thick and succulent, green, or often glaucous beneath, densely short-pilose with viscid hairs, or sometimes glabrate in age; inflorescence ample, paniculate, the branches stout, opposite, densely viscid-pilose, the bracts very small, the peduncles slender, elongate, the involucre 5–6 mm. long at anthesis, in age 12–18 mm. broad, densely viscid-pilose, the lobes broadly rounded; flowers usually 3 in each involucre, the perianth sparsely pilose, pink; stamens usually 3, exserted; fruit obovoid, 5 mm. long, brown, glabrous, the angles acute, narrow, smooth, the sides rugulose or obscurely tuberculate, conspicuously raphidulous; seed broadly obovoid, 3–3.5 mm. long, pale-brown.

TYPE LOCALITY: Barber County, Kansas.

DISTRIBUTION: Oklahoma and southern Kansas.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 1730.

7. *Allionia coccinea* (Torr.) Standley, Contr. U. S. Nat. Herb.  
12: 339. 1909.

*Oxybaphus coccineus* Torr. Bot. Mex. Bound. Surv. 169. 1859.

*Mirabilis coccinea* Benth. & Hook. Gen. Pl. 3: 3. 1880.

*Oxybaphus linearifolius* S. Wats. Proc. Am. Acad. 17: 375. 1882.

*Allionia linearifolia* Kuntze, Rev. Gen. 533. 1891.

*Mirabilis coccinea scabridata* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.

*Allionia linearis coccinea* M. E. Jones, Contr. West. Bot. 10: 51. 1902.

*Allionia gracillima* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.

*Allionia gracillima filifolia* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.

*Allionia gracillima scabridata* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.

*Allionia linearifolia filifolia* Standley, Contr. U. S. Nat. Herb. 16: 120. 1913.

Stems solitary or numerous from an elongate woody root, erect or ascending, sparsely or copiously branched, the branches very slender, glaucous, glabrous, ascending, the internodes short or elongate; leaves numerous or few, sessile, the blades filiform or linear, 2–12 cm. long, 1–4 mm. wide, long-attenuate to each end, thick and succulent, glaucous or glaucescent, at least beneath, glabrous; involucre slender-pedunculate, axillary and solitary in young plants and mostly with cleistogamous flowers, in mature plants arranged in loose paniculate cymes, these with slender, opposite, sparsely short-pilose branches; involucre at anthesis 4–5 mm. long, short-pilose or puberulent, deeply lobed, the lobes oval-ovate, acute or acutish, slightly accrescent in age; flowers 1–3 in each involucre, the perianth 15–20 mm. long, deep purplish-red, the tube 3–4 mm. in diameter, gradually widening upward, the limb 11–15 mm. broad, deeply 5-lobed, the lobes retuse; stamens 5, exserted; anthocarp obovoid, 5 mm. long, oli-



vaceous, finely hirtellous, 5-lobed, the angles broad, smooth or tuberculate, the sulci coarsely transverse-rugose; seed broadly obovoid, 2.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: Hillsides, Copper Mines [Santa Rita], New Mexico.

DISTRIBUTION: Dry hillsides, southwestern New Mexico, southeastern Arizona, and northern Sonora.

8. *Allionia gausapoides* Standley, Contr. U. S. Nat. Herb. 13: 406. 1911.

*Mirabilis linearis subhispida* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.

*Allionia linearis subhispida* Standley, Contr. U. S. Nat. Herb. 12: 342. 1909.

*Allionia subhispida* Standley, Contr. U. S. Nat. Herb. 16: 120. 1913.

Stems solitary or few, erect or decumbent, stout, 3–8 dm. high, sparsely branched, glaucous or glaucescent, densely hirsute at the base, viscid-puberulent or short-pilose above; leaves distant or crowded, sessile, the blades linear or lance-linear, 3–10 cm. long, 1.5–5 mm. wide, attenuate to each end, entire, thick and succulent, glaucous or glaucescent beneath, densely short-pilose or hirsute or sometimes glabrate; inflorescence terminal, cymose-paniculate, sparsely branched, the branches slender, alternate, viscid-puberulent or densely villous; involucre few, slender-pedunculate, solitary or clustered, at anthesis 3.5–5 mm. long, in age about 15 mm. broad, densely viscid-villous with fulvous hairs, the lobes broadly rounded; flowers usually 3 in each involucre, the perianth about 1 cm. long, pink, sparsely short-pilose; stamens 5, exserted; anthocarp obovoid, 4.5–5 mm. long, short-hirtellous, olivaceous, the angles broad, smooth, the sides coarsely transverse-rugose.

TYPE LOCALITY: Region of San Luis Potosí, San Luis Potosí.

DISTRIBUTION: In dry soil, New Mexico and western Texas to San Luis Potosí.

9. *Allionia linearis* Pursh, Fl. Am. Sept. 728. 1814.

*Calymenia angustifolia* Nutt. Gen. 1: 26. 1818.

*Calymenia decumbens* Nutt. Gen. 1: 26. 1818.

*Allionia decumbens* Spreng. Syst. 1: 384. 1825.

*Oxybaphus angustifolius* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus decumbens* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus angustifolius linearis* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus angustifolius decumbens* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Mirabilis angustifolia* MacM. Metasp. Minn. Valley 216. 1892.

*Oxybaphus Bodini* Holz. Contr. U. S. Nat. Herb. 1: 287. 1893.

*Allionia Bodini* Morong, Mem. Torrey Club 5: 354. 1894.

*Allionia Bushii* Britton, Bull. Torrey Club 22: 223. 1895.

*Oxybaphus angustifolius viscidus* Eastw. Proc. Calif. Acad. II. 6: 313. 1896.

*Mirabilis nyctaginea angustifolia* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Allionia diffusa* Heller, Minn. Bot. Stud. 2: 33. 1898.

*Mirabilis linearis* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.

*Allionia glandulifera* A. Nelson, Bot. Gaz. 34: 364. 1902.

*Allionia divaricata* Rydb. Bull. Torrey Club 29: 691. 1902.

*Allionia viscida* Cockerell, Proc. Acad. Phila. 1904: 108. 1904.

*Allionia montanensis* Osterhout, Muhlenbergia 1: 39. 1906.

*Mirabilis decumbens* Daniels, Univ. Missouri Stud. Sci. 1: 276. 1907.

*Oxybaphus linearis* B. L. Robinson, Rhodora 10: 31. 1908.

*Allionia petrophila* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.

*Allionia Vaseyi* Standley, Contr. U. S. Nat. Herb. 12: 343. 1909.

*Allionia pinetorum* Standley, Contr. U. S. Nat. Herb. 12: 344. 1909.

*Allionia pilosa decumbens* A. Nelson; Coult. & Nels. Man. 173. 1909.

*Allionia linearis Bodini* A. Nelson; Coult. & Nels. Man. 174. 1909.

Plants erect or decumbent, 1–12 dm. high, the stems solitary or several, simple or branched below, the branches ascending, slender or stout, glaucous, often nearly white, glabrous below or bifariously puberulent, viscid-puberulent or short-villous above, the internodes short or elongate; leaves numerous or few, sometimes crowded, the blades narrowly linear to lance-linear, 3–10 cm. long, 1–5 or rarely 12 mm. wide, attenuate and sessile at the base or gradually narrowed to a short stout marginate petiole, narrowed to the obtuse or acute apex, entire, thick and succulent, usually glaucous, at least beneath, often ciliate, glabrous, or those of the uppermost leaves viscid-puberulent; involucre slender-pedunculate, usually all axillary in young plants and with cleistogamous flowers, the plants in age developing a loosely branched cymose panicle, the branches slender, opposite or alternate, viscid-puberulent or short-villous with mostly fulvous hairs, bearing few or numerous reduced bractlike leaves, these sessile,



linear to broadly ovate; involucre at anthesis about 4 mm. long, densely viscid-villous with fulvous hairs, the lobes ovate-orbicular or oval, rounded or acutish at the apex, the involucre in age 12–20 mm. broad, the lobes rounded, conspicuously veined; flowers usually 3 in each involucre, the perianth about 10 mm. long, sparsely pilose, pale-pink to purplish-red, the limb deeply lobed, the lobes retuse; anthocarp 4.5–5 mm. long, obovoid, brownish or olivaceous, the angles smooth, the sides coarsely transverse-rugose; seed rounded-obovoid, 3 mm. long, pale yellowish-brown.

TYPE LOCALITY: "Upper Louisiana."

DISTRIBUTION: Usually in dry soil, South Dakota to Montana, Arizona, San Luis Potosí, Texas, and western Missouri, rarely adventive eastward.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1419, 1421; ed. 2, f. 1726; Contr. U. S. Nat. Herb. 1: pl. 21; Clements, Rocky Mt. Fl. pl. 8, f. 1.

#### 10. *Allionia decipiens* Standley, sp. nov.

*Allionia divaricata* Standley, Contr. U. S. Nat. Herb. 12: 342, in part. 1909. Not *A. divaricata* Rydb. 1902.

Stems solitary or few, erect or decumbent, 3–8 dm. high, slender, simple or sparsely branched below the inflorescence, green, bifariously puberulent or glabrate, the internodes elongate, usually longer than the leaves; petioles slender, 0.2–3.5 cm. long, or the uppermost leaves sessile, the blades lanceolate to linear, 2.5–12 cm. long, 2.5–10 or rarely 20 mm. wide, obtuse to attenuate at the base, narrowed to the obtuse or acute apex, entire, bright-green, usually ciliate but otherwise glabrous; inflorescence loosely cymose-paniculate, the branches slender, alternate, viscid-villous with short fulvous hairs; involucre usually crowded, on short slender peduncles, 4–5 mm. long at anthesis, 10–12 mm. broad in fruit, densely viscid-villous, the lobes ovate-oval, rounded or obtuse at the apex; flowers 3 in each involucre, the perianth 8–10 mm. long, deep purplish-red, sparsely short-pilose, the limb 5-lobed, the lobes retuse; fruit obovoid, 4.5 mm. long, olivaceous, minutely hirtellous, the angles smooth, the sides transverse-rugose; seed oval-obovoid, 2.5 mm. long, pale yellowish-brown.

Type collected in an oak thicket, Brazos Canyon, Rio Arriba County, New Mexico, August 24, 1914, P. C. Standley & H. C. Bollman 10743 (U. S. Nat. Herb. no. 689453).

DISTRIBUTION: Mountain slopes, Arizona, New Mexico, and southern Colorado.

#### 11. *Allionia hirsuta* Pursh, Fl. Am. Sept. 728. 1814.

*Calymenia pilosa* Nutt. Gen. 1: 26. 1818.

*Calymenia hirsuta* Nutt. Gen. 1: 26. 1818.

*Oxybaphus pilosus* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus hirsutus* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus hirsutus integrifolius* Choisy, in DC. Prodr. 13: 433. 1849.

*Oxybaphus nyctagineus pilosus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.

*Mirabilis hirsuta* MacM. Metasp. Minn. Valley 217. 1892.

*Mirabilis nyctaginea hirsuta* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Mirabilis nyctaginea pilosa* Heimerl, Beitr. Syst. Nyct. 23, in part. 1897.

*Allionia pilosa* Rydb. Bull. Torrey Club 29: 690. 1902.

*Allionia aggregata* Rydb. Bull. Torrey Club 29: 692. 1902. Not *A. aggregata* Spreng. 1825.

*Allionia hirsuta rotundifolia* Lunell, Bull. Leeds Herb. 2: 6. 1908.

*Allionia hirsuta coloradensis* Standley, Contr. U. S. Nat. Herb. 12: 353. 1909.

*Allionia chersophila* Standley, Contr. U. S. Nat. Herb. 12: 354. 1909.

*Allionia hirsuta aggregata* A. Nelson; Coult. & Nels. Man. 173, in part. 1909.

*Allionia pilosa decumbens* A. Nelson; Coult. & Nels. Man. 173, in part. 1909. Not *Calymenia decumbens* Nutt. 1818.

Stems solitary or few, erect or decumbent, 2–10 dm. high, usually very stout, simple or sparsely branched below the inflorescence, green or glaucescent, densely hirsute or long-pilose near the base and usually up to the inflorescence, sometimes merely puberulent, but always hirsute about the nodes, the internodes usually elongate; petioles 5 mm. long or shorter, very stout, usually wanting; leaf-blades mostly ovate-oblong, sometimes lance-linear or broadly ovate, 3–11 cm. long, 0.4–5 cm. wide, subcordate to long-attenuate at the base, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, thick and succulent or sometimes thin, usually bright-green, densely hirsute or long-pilose or often merely viscid-puberulent or, in age, glabrate; inflorescence in young plants often wholly of axillary involucre, in mature plants cymose-paniculate, copiously or sparsely branched, the branches mostly opposite, densely viscid-pilose, bearing few reduced bractlike leaves; involucre commonly 3-flowered,



slender-pedunculate, 4–5 mm. long in anthesis, in age 10–18 mm. long, densely or sparsely viscid-pilose, the lobes broad, rounded or obtuse; perianth 8–10 mm. long, sparsely pilose, pink; stamens 3–5, long-exserted; fruit obovoid, 4–5 mm. long, dark-olivaceous, densely short-pilose, the angles broad, smooth or nearly so, the sides rugose or short-tuberculate; seed obovoid, 3 mm. long, brownish-stramineous.

TYPE LOCALITY: "Upper Louisiana."

DISTRIBUTION: Dry fields and hillsides, Wyoming to Manitoba and Wisconsin, southward to Missouri, Texas, and New Mexico; rarely adventive eastward.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1418; ed. 2, f. 1728.

## 12. *Allionia pauciflora* (Buckl.) Standley.

*Oxybaphus pauciflorus* Buckl. Proc. Acad. Phila. 1862: 7. 1862.

*Allionia gigantea* Standley, Contr. U. S. Nat. Herb. 12: 348. 1909.

*Oxybaphus giganteus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems solitary or few, 5–15 dm. high, erect or decumbent, very stout, simple or sparsely branched below the inflorescence, green or glaucescent, densely puberulent throughout, the internodes usually short; petioles 5 mm. long or shorter, very stout, most of the leaves sessile; leaf-blades ovate-oblong to rhombic-ovate, ovate-deltoid, or rounded-ovate, 3.5–10 cm. long, 1.5–7.5 cm. wide, subcordate or rounded at the base and often abruptly short-decurrent, rounded or obtuse at the apex, entire or subsinuate, bright-green, or glaucescent beneath, thick and succulent, densely puberulent or sometimes glabrate; inflorescence paniculate, copiously or sparsely branched, the branches slender or stout, opposite, densely viscid-puberulent or short-pilose, bearing few or numerous reduced bractlike leaves; involucre slender-pedunculate, mostly 3-flowered, about 4 mm. long at anthesis, 8–12 mm. long in fruit, densely or sparsely pilose, the lobes short, rounded; perianth about 8 mm. long, pale-pink, short-pilose, the limb about 12 mm. broad; stamens 3–5, long-exserted; fruit obovoid, 4–5 mm. long, dark-olivaceous, hirtellous, the angles broad, coarsely tuberculate or composed of large distinct tubercles, the sides also tuberculate; seed obovoid, 3 mm. long, brownish-stramineous.

TYPE LOCALITY: On the San Saba River, north of Fort Mason, Texas.

DISTRIBUTION: Oklahoma and Texas.

## 13. *Allionia albida* Walt. Fl. Car. 84. 1788.

*Calymenia albida* Nutt. Gen. 1: 26. 1818.

*Oxybaphus albidus* Sweet, Hort. Brit. 2: 429. 1827.

*Calymenia granulata* Raf. Aut. Bot. 15. 1840.

*Oxybaphus angustifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 433, in part. 1849. Not *O. angustifolius* Sweet. 1827.

*Mirabilis nyctaginea albida* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Mirabilis albida* Heimerl, Ann. Cons. Jard. Genève 5: 182. 1901.

*Mirabilis albida uniflora* Heimerl, Ann. Cons. Jard. Genève 5: 182. 1901.

*Allionia bracteata* Rydb. Bull. Torrey Club 29: 690. 1902.

*Allionia decumbens* Rydb. Bull. Torrey Club 29: 692. 1902. Not *A. decumbens* Spreng. 1825.

*Allionia lanceolata* Standley, Contr. U. S. Nat. Herb. 12: 355, in part. 1909. Not *A. lanceolata* Rydb. 1902.

*Allionia lanceolata uniflora* Standley, Contr. U. S. Nat. Herb. 12: 355. 1909.

Stems solitary or few, 2–12 dm. high, erect or decumbent, stout or slender, simple or sparsely branched below the inflorescence, glaucous or glaucescent, glabrous or bifariously puberulent, the internodes elongate or often very short; petioles 5 mm. long or shorter, stout, usually wanting; leaf-blades mostly narrowly lanceolate, sometimes linear to ovate, 4.5–10 cm. long, 0.3–2.8 cm. wide, acute to long-attenuate at the base, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, usually thick and succulent, bright-green, or often very glaucous beneath, glabrous or very sparsely short-pilose; inflorescence often wholly of axillary involucre in young plants, in mature plants cymose-paniculate, copiously branched, the branches slender or stout, opposite or alternate, puberulent or shortly viscid-pilose, often bearing very numerous reduced bractlike leaves; involucre 1–3-flowered, slender-pedunculate, about 4 mm. long at anthesis, 8–14 mm. long in fruit, densely or sparsely viscid-pilose, the lobes short, rounded; perianth 8–10 mm. long, pale-pink, sparsely pilose; stamens 3–5, exserted; fruit obovoid, 5 mm. long, dark-olivaceous, short-hirtellous, the angles broad and coarsely



tuberculate or composed of distinct tubercles, the sides also tuberculate; seed obovoid, 3.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Meadows and hillsides, South Carolina and Georgia to Tennessee, Kansas, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1417; ed. 2, f. 1727.

14. *Allionia lanceolata* Rydb. Bull. Torrey Club 29: 691. 1902.

*Allionia sessilifolia* Osterhout, Bull. Torrey Club 32: 611. 1905.

Stems few or solitary, erect or ascending, 4–10 dm. high, stout, simple or sparsely branched below the inflorescence, sparsely puberulent or glabrate below, short-pilose above with mostly viscid hairs, the internodes short or elongate; leaf-blades sessile or on very stout petioles 4 mm. long or shorter, lanceolate or lance-ovate, 3.5–10 cm. long, 1–4 cm. wide, usually rounded at the base but sometimes obtuse or acute, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, bright-green, or glaucescent beneath, glabrous or sparsely short-pilose, usually ciliolate; inflorescence paniculate, much branched, the branches slender, opposite, shortly viscid-pilose; involucre slender-pedunculate, about 4 mm. long at anthesis, in age about 1 cm. long, densely viscid-pilose, the lobes oval, rounded at the apex; flowers usually 3 in each involucre, the perianth about 8 mm. long, sparsely pilose, pink; stamens 5, exserted; fruit obovoid, 5 mm. long, dark-olivaceous, finely hirtellous, the angles narrow, smooth, the sides rugose or short-tuberculate; seed obovoid, 2.5–3 mm. long, brownish-stramineous.

TYPE LOCALITY: Estes Park, Larimer County, Colorado.

DISTRIBUTION: Southern Wyoming and northern Colorado.

15. *Allionia aggregata* (Ortega) Spreng. Syst. 1: 384. 1825.

*Calyxhymenia aggregata* Ortega, Dec. 81. 1798.

*Mirabilis aggregata* Cav. Ic. 5: 22. 1799.

*Calymenia aggregata* Pers. Syn. Pl. 1: 37. 1805.

*Oxybaphus aggregatus* Vahl, Enum. 2: 41. 1806.

*Allionia albida* Coult. Contr. U. S. Nat. Herb. 2: 352, in part. 1894. Not *A. albida* Walt. 1788.

*Mirabilis pseudaggregata* Heimerl, Ann. Cons. Jard. Genève 5: 183. 1901.

*Mirabilis pseudaggregata subhirsuta* Heimerl, Ann. Cons. Jard. Genève 5: 184. 1901.

*Mirabilis pseudaggregata eglandulosa* Heimerl, Ann. Cons. Jard. Genève 5: 184. 1901.

*Allionia trichodonta* Standley, Contr. U. S. Nat. Herb. 12: 354. 1909.

*Allionia pseudaggregata* Standley, Contr. U. S. Nat. Herb. 12: 356. 1909.

*Allionia pseudaggregata subhirsuta* Standley, Contr. U. S. Nat. Herb. 12: 356. 1909.

*Allionia hirsuta aggregata* A. Nelson; Coult. & Nels. Man. 173, in part. 1909.

*Oxybaphus pseudaggregatus* Weatherby, Proc. Am. Acad. 45: 425. 1910.

Stems few or numerous, stout, erect or decumbent, 1.5–10 dm. high, sparsely branched or simple below the inflorescence, usually glabrous below but sometimes bifariously puberulent or short-pilose, glabrate, puberulent, or short-pilose above with mostly viscid hairs, or rarely sparsely hirsute, the internodes usually elongate; leaf-blades sessile or on very short stout petioles, linear-lanceolate, lanceolate, lance-oblong, or lance-ovate, 1.2–10 cm. long, 0.3–3 cm. wide, acute to long-attenuate at the base, gradually narrowed to the acute or obtuse apex, entire or sinuate, thick and succulent, green, or glaucescent beneath, glabrous or sparsely hirsute or short-pilose, often ciliate; involucre usually all axillary in young plants, in mature plants arranged in an ample cymose inflorescence, this sparsely branched, the branches slender, alternate, viscid-pilose, bearing few or numerous reduced bractlike leaves, the involucre slender-pedunculate, viscid-pilose, at anthesis 4–5 mm. long, in age 6–9 mm. long, the lobes ovate or oval, acutish or rounded; flowers usually 3 in each involucre, the perianth 8–10 mm. long, sparsely pilose, pink; stamens 3–5, exserted; fruit broadly obovoid, 3.5–5 mm. long, brownish or olivaceous, short-hirtellous, the angles broad, smooth or nearly so, the sides rugose or short-tuberculate; seed oval or obovoid, 2.5–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Western Texas and Chihuahua to the State of Mexico.

ILLUSTRATIONS: Ortega, Dec. pl. 11; Cav. Ic. pl. 437.

16. *Allionia coahuilensis* Standley, Contr. U. S. Nat. Herb. 12: 347. 1909.

*Allionia Greggii* Standley, Contr. U. S. Nat. Herb. 12: 348. 1909.

*Oxybaphus coahuilensis* Weatherby, Proc. Am. Acad. 45: 425. 1910.



Stems few, from a thick woody root, erect, 6–10 dm. high, simple or sparsely branched below the inflorescence, stout, glaucescent, densely puberulent below, short-pilose above; petioles stout, 1.5 cm. long or shorter, very short in the uppermost leaves, pilose; leaf-blades ovate, ovate-oblong, or deltoid-lanceolate, 2.5–5 cm. long, 0.7–2 cm. wide, obtuse or truncate at the base and decurrent, narrowed to the obtuse or acutish apex, entire or undulate, succulent, thick-coriaceous when dry, glaucescent beneath, densely puberulent or short-pilose; inflorescence cymose-paniculate, copiously branched, the branches rather slender, mostly alternate, densely viscid-pilose, bearing numerous reduced bractlike sessile leaves; involucre numerous, 3-flowered, short-pedunculate, 4–5 mm. long at anthesis, about 8 mm. long in fruit, densely viscid-pilose with fulvous hairs, the lobes shorter than the tube, ovate-orbicular, broadly obtuse; perianth 10–12 mm. long, sparsely pilose; stamens 5, exserted; fruit obovoid, 4–5 mm. long, brownish-olivaceous, minutely pilose, the angles broad, smooth, the sides rugulose or short-tuberculate; seed broadly obovoid, 2–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Vicinity of the type locality.

17. *Allionia pumila* Standley, Contr. U. S. Nat. Herb. 12: 345. 1909.

*Oxybaphus nyctagineus pilosus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859. Not *Allionia pilosa* Nutt. 1818.

*Allionia Brandegei* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

*Allionia pachyphylla* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

*Allionia comata* Standley, Contr. U. S. Nat. Herb. 12: 348, in part. 1909. Not *A. comata* Small, 1903.

*Oxybaphus Brandegei* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or usually numerous, from a thick woody root, ascending or procumbent, 1–5 dm. long, very stout, much branched, the branches mostly divaricate, sometimes ascending, whitish, densely pilose with short soft hairs, or rarely glabrate in age, the internodes usually elongate; petioles stout, 2.5 cm. long or shorter, those of the uppermost leaves usually very short, densely pilose; leaf-blades mostly deltoid or ovate-deltoid, 1.5–5 cm. long, 1.3–4 cm. wide, truncate or subcordate at the base and often abruptly short-decurrent, rounded to acutish at the apex, entire or subsinuate, very thick and succulent, thick-coriaceous when dry, yellowish-green above, glaucous or glaucescent beneath, densely puberulent or short-pilose; inflorescence in young plants often wholly of axillary involucre, in mature plants a small narrow cyme, this sparsely branched, the branches stout, alternate, densely viscid-pilose, usually with numerous small broad reduced bractlike leaves; involucre few, short-pedunculate, 3-flowered, at anthesis 3–4 mm. long, in age about 8 mm. long, densely viscid-pilose with short fulvous hairs, the lobes ovate-orbicular, rounded or acutish; perianth 8–10 mm. long, sparsely pilose, pale-pink, the limb about 12 mm. broad, stamens usually 3, long-exserted; fruit obovoid, 5 mm. long, brownish-olivaceous, short-pilose, the angles narrow, smooth, or rugose on their sides, the sides of the fruit rugulose; seed broadly obovoid, 2.5–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Kingman, Arizona.

DISTRIBUTION: Dry plains and hillsides, western New Mexico to Nevada and southeastern California.

18. *Allionia rotundifolia* Greene, Pl. Baker. 3: 33. 1901.

*Allionia polytricha* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

Stems few, from a thick woody root, erect or ascending, 3–7 dm. long, very stout, sparsely branched, the branches ascending, pale, densely hirsute below with stiff fulvous hairs, the internodes elongate; petioles very stout, those of the lowest leaves one third as long as the blades, those of the upper leaves very short or wanting, hirsute; leaf-blades ovate-deltoid to deltoid-orbicular or even orbicular, 7 cm. long and 6 cm. wide or smaller, rounded or subcordate at the base, obtuse to rounded at the apex, thick-coriaceous, entire, yellowish-green, above, usually glaucescent beneath, more or less hirsute when young, especially along the veins, glabrate in age; inflorescence cymose, sparsely branched, the branches stout, alternate, densely



viscid-pilose with fulvous hairs, bearing numerous reduced sessile bractlike leaves; involucre few, short-pedunculate, 3-flowered, at anthesis 4–6 mm. long, densely viscid-pilose with short fulvous hairs, the lobes broadly ovate or ovate-orbicular, rounded or acutish at the apex; perianth sparsely pilose; fruit obovoid, 4–5 mm. long, puberulent, the angles narrow, smooth, the sides rugulose.

TYPE LOCALITY: Swallow's, between Pueblo and Canyon City, Colorado.

DISTRIBUTION: Vicinity of the type locality.

### 19. *Allionia nyctaginea* Michx. Fl. Bor. Am. 1: 100. 1803.

*Allionia ovata* Pursh, Fl. Am. Sept. 97. 1814.

*Calymenia nyctaginea* Nutt. Gen. 1: 26. 1818.

*Oxybaphus nyctagineus* Sweet, Hort. Brit. 1: 334. 1826.

*Calyxhymenia paniculata* Desf. Cat. Hort. Par. 390. 1829.

*Allionia cucullata* Fisch. Mey. & Avé-Lall. Ind. Sem. Hort. Petrop. 9: 55. 1843.

*Oxybaphus glabrifolius minor* Choisy, in DC. Prodr. 13<sup>2</sup>: 431. 1849.

*Oxybaphus Cervantesii grandifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus floribundus* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus cucullatus* Choisy, in DC. Prodr. 13<sup>2</sup>: 434. 1849.

*Oxybaphus nyctagineus latifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859.

*Oxybaphus nyctagineus oblongifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859.

*Allionia floribunda* Kuntze, Rev. Gen. 533. 1891.

*Mirabilis nyctaginea* MacM. Metasp. Minn. Valley 217. 1892.

*Allionia nyctaginea ovata* Morong, Mem. Torrey Club 5: 146. 1894.

*Mirabilis nyctaginea oblongifolia* Heimerl, Beitr. Syst. Nyct. 23, excluding description. 1897.

*Mirabilis oblongifolia* Heimerl, Ann. Cons. Jard. Genève 5: 181, excluding description. 1901.

*Allionia oblongifolia* Small, Fl. SE. U. S. 407, excluding description. 1903.

*Allionia latifolia* Standley, Contr. U. S. Nat. Herb. 12: 350. 1909.

*Allionia foliosa* Standley, Contr. U. S. Nat. Herb. 13: 409. 1911.

Stems numerous from an elongate, somewhat fleshy root, erect or decumbent, stout, 3–12 dm. high, simple or sparsely branched below, green or glaucescent, glabrous or bifariously puberulent; petioles slender, 1–3 cm. long, glabrous or sparsely puberulent; leaf-blades mostly deltoid or ovate-deltoid, sometimes ovate-cordate, ovate, or ovate-oblong, 4–12 cm. long, 1.5–9 cm. wide, cordate to rounded at the base, acute to attenuate at the apex or rarely rounded, entire or subsinuate, thin, bright-green, glabrous, usually ciliolate; inflorescence sometimes wholly of axillary involucre but usually cymose, the cymes small and dense, leafy, the branches alternate, slender, pilose; involucre on slender elongate peduncles, 3-flowered, 5–6 mm. long in anthesis, in age 10–17 mm. long, puberulent or short-pilose near the base, the lobes short, rounded or obtuse, often apiculate, glabrous, long-ciliate; perianth about 10 mm. long, glabrous or very sparsely villous, white or pale-pink, the limb 12–15 mm. broad; stamens 3–5, exserted; fruit obovoid, 5 mm. long, dark-brown or olivaceous, densely short-pilose, the angles broad, more or less rugulose, the sides rugulose or finely tuberculate; seed broadly obovoid, 3 mm. long, pale-brown.

TYPE LOCALITY: Banks of the Tennessee River.

DISTRIBUTION: Montana to Wisconsin, southward to Colorado, Texas, and Alabama; Oaxaca; frequently adventive in the eastern United States.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1416; ed. 2. f. 1729; Iowa Geol. Surv. Bull. 4: f. 68.

### 20. *Allionia Grayana* Standley, sp. nov.

*Oxybaphus nyctagineus latifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.

*Allionia nyctaginea latifolia* Coult. Contr. U. S. Nat. Herb. 2: 352, in part. 1894.

*Allionia latifolia* Standley, Contr. U. S. Nat. Herb. 12: 350, excluding synonym. 1909.

Stems erect, 3–12 dm. high, simple or sparsely branched below the inflorescence, glaucescent, glabrous below or bifariously puberulent; petioles slender or stout, 0.5–2 cm. long, the uppermost leaves often sessile; leaf-blades deltoid or rounded-deltoid, sometimes broadly ovate, 2.5–5.5 cm. long, 1.5–3.5 cm. wide, subcordate, truncate, or rounded at the base, rounded or very obtuse at the apex or rarely acute, entire or subundulate, subcoriaceous when dry, often glaucescent beneath, sparsely pilose or glabrous, often ciliolate; inflorescence cymose-paniculate, usually much branched, the branches slender, mostly opposite, viscid-pilose, usually bearing numerous reduced bractlike leaves; involucre numerous, 3-flowered, slender-pedunculate, 4–5 mm. long in anthesis, 10–14 mm. long in fruit, densely viscid-pilose, the lobes rounded-ovate, commonly rounded at the apex but sometimes acutish; perianth about 10 mm. long,



sparsely pilose, pink; stamens usually 5, exserted; fruit broadly obovoid, 4 mm. long, dark-brown, finely pilose, the angles narrow, tuberculate, the sides finely and closely tuberculate; seed broadly obovoid, 2.5–3 mm. long, pale-brown.

Type collected in western Texas in 1849, *Charles Wright 603* (U. S. Nat. Herb. no. 22766).

DISTRIBUTION: Western Texas.

21. *Allionia suffruticosa* Standley, Contr. U. S. Nat. Herb. 13: 408. 1911.

Plants suffrutescent below and much branched, 3–5 dm. high, the branches slender, terete, ascending, glaucescent and glabrous below, the middle internodes greenish, bifariously puberulent, the internodes elongate; petioles slender, 5–10 mm. long, glabrous or minutely puberulent; leaf-blades deltoid or deltoid-ovate, 2–4 cm. long, 1–2.5 cm. wide, entire or subundulate, thin, bright-green, sparsely pilose or glabrous, subcordate to rounded at the base, obtuse or acute at the apex; inflorescence of few small cymes, these sparsely branched, the branches very slender, alternate, viscid-pilose, bearing few or numerous reduced sessile bractlike leaves; involucre few, 3-flowered, 5 mm. long at anthesis, 8 mm. long in fruit, densely viscid-pilose with fulvous hairs, the lobes ovate or oval, rounded or obtuse; perianth 10–12 mm. long, sparsely pilose, pink; fruit broadly obovoid, 5 mm. long, dark-brown, sparsely short-pilose, the angles very prominent, composed of distinct tubercles, the sides broad, very finely tuberculate; seed broadly obovoid, 3.5 mm. long, brownish-stramineous.

TYPE LOCALITY: Los Naranjos, Oaxaca.

DISTRIBUTION: Oaxaca.

22. *Allionia comata* Small, Fl. SE. U. S. 407. 1903.

*Oxybaphus nyctagineus Cervantesii* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859. Not *Calyxhymenia Cervantesii* Desf. 1829.

*Oxybaphus nyctagineus oblongifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.

*Oxybaphus viscosus* Hemsl. Biol. Centr. Am. Bot. 3: 3, in part. 1882. Not *O. viscosus* L'Hér. 1849.

*Oxybaphus Cervantesii* S. Wats. Proc. Am. Acad. 18: 142. 1883.

*Allionia nyctaginea Cervantesii* Coult. Contr. U. S. Nat. Herb. 2: 352. 1894. Not *A. Cervantesii* Steud. 1840.

*Mirabilis nyctaginea setigera* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Mirabilis nyctaginea oblongifolia* Heimerl, Beitr. Syst. Nyct. 23, in part. 1897.

*Mirabilis nyctaginea Cervantesii* Heimerl, Beitr. Syst. Nyct. 23. 1897.

*Mirabilis nyctaginea alpicola* Heimerl, Beitr. Syst. Nyct. 23. 1897.

*Allionia pratensis* Standley, Contr. U. S. Nat. Herb. 12: 351. 1909.

*Allionia melanotricha* Standley, Contr. U. S. Nat. Herb. 12: 351. 1909.

*Oxybaphus melanotrichus* Weatherby, Proc. Am. Acad. 45: 425. 1910.

*Oxybaphus comatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

*Oxybaphus pratensis* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, from a woody root, usually erect, sometimes decumbent, 3–12 dm. high, stout or slender, simple or sparsely branched below the inflorescence, sometimes with weak sterile branches at the base, green, or glaucescent below, glabrous below or bifariously puberulent, very rarely pilose with soft viscid fulvous hairs, pilose or short-pilose above but the pubescence usually bifarious below the inflorescence, the internodes usually elongate; petioles slender, 1–5 cm. long, glabrous or puberulent, rarely white-pilose in the earliest leaves; leaf-blades usually elongate-deltoid but sometimes deltoid, ovate, or lanceolate, 3–10 cm. long, 0.8–5.5 cm. wide, subcordate or truncate at the base or sometimes cordate, obtuse, or acutish, acute or attenuate at the apex or often obtuse, rarely rounded, entire or subundulate, thin, bright-green, sparsely viscid-puberulent or short-pilose or glabrous, commonly ciliolate; inflorescence cymose-paniculate, usually narrow and sparsely branched, sometimes broad and loosely branched, the branches slender, alternate, viscid-pilose with fulvous hairs, bearing very few bractlike leaves; involucre few or numerous, usually short-pedunculate, 3–5 mm. long at anthesis, about 8 mm. long in fruit, densely viscid-pilose with fulvous or often black hairs, the lobes oval-oblong, usually longer than the tube and rounded at the apex; perianth 10–12 mm. long, purplish-red, sparsely pilose, the limb sometimes 20 mm. broad; stamens 3–5, long-exserted; fruit obovoid, 3–4.5 mm. long, brownish- or blackish-olivaceous, minutely



pilose, the angles broad, usually tuberculate, the sides coarsely or finely tuberculate; seed obovoid, 2–3 mm. long, brownish-stramineous.

TYPE LOCALITY: New Mexico, probably about Santa Rita.

DISTRIBUTION: Meadows and thickets in the mountains, Arizona to western Texas, southward to Sonora and Puebla.

### 23. *Allionia longipes* Standley, sp. nov.

*Allionia melanotricha* Standley, Contr. U. S. Nat. Herb. 13: 409, in part. 1911.

Plants about a meter high, copiously branched below, the branches stout, ascending, glaucescent, bifariously puberulent, the internodes elongate; petioles slender, 2–5.5 cm. long, puberulent; leaf-blades deltoid-cordate, 2–5.5 cm. long, 2–4.5 cm. wide, deeply cordate at the base and subdecurent, acute or attenuate at the apex, entire, thin, bright-green, minutely puberulent or glabrate, ciliolate; inflorescence cymose-paniculate, about 30 cm. long, copiously branched, the branches chiefly alternate, stout, viscid-pilose with fulvous hairs, very sparsely bracteate; involucre numerous, 3-flowered, slender-pedunculate, 4–5 mm. long at anthesis and 7–8 mm. in fruit, densely fulvous-pilose, the lobes short, deltoid-ovate or rounded-ovate, acute or acutish, at least in fruit; perianth about 12 mm. long, sparsely pilose; stamens 3, short-exserted; fruit obovoid, 5 mm. long, brownish-olivaceous, densely short-pilose, the angles broad, smooth or slightly rugulose, the sides rugulose; seed obovoid, 3 mm. long, pale-brown.

Type collected in the vicinity of Durango, State of Durango, in 1896, *Edward Palmer 261* (U. S. Nat. Herb. no. 304437).

### 24. *Allionia ciliata* Standley, Contr. U. S. Nat. Herb. 12: 345. 1909.

*Oxybaphus aggregatus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 168. 1859. Not *O. aggregatus* Vahl, 1806.

*Allionia deltoidea* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

*Oxybaphus ciliatifolius* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few, from a slender woody root, 2–4 dm. high, rather slender, copiously branched, glaucous, glabrous or bifariously puberulent, the lower internodes short, the upper elongate; petioles stout, 0.5–2 cm. long, sparsely pilose with stout white hairs; leaf-blades elongate-deltoid, ovate-deltoid, or deltoid-lanceolate, 0.5–1.8 cm. wide, entire or subundulate, succulent, coriaceous when dry, glaucous or glaucescent beneath, sparsely pilose or glabrate, long-ciliate, at least near the base; inflorescence of numerous small dense cymes, or of axillary involucre in young plants, the branches slender, puberulent and pilose; involucre 3-flowered, short-pedunculate, about 4 mm. long at anthesis and 8 mm. in fruit, densely white-pilose, the lobes short, broadly ovate or ovate-orbicular, acute or acutish, at least in age; perianth about 1 cm. long, very sparsely pilose or glabrous, the limb about 15 mm. broad; stamens 5, exserted; fruit broadly obovoid, 3.5–4 mm. long, dark-brown, sparsely and minutely pilose, the angles broad, obscurely rugulose, the sides also slightly rugulose; seed globose-obovoid, 2 mm. long, pale-brown.

TYPE LOCALITY: Smiths Run, western Texas.

DISTRIBUTION: Western Texas and Coahuila.

### 25. *Allionia violacea* L. Syst. ed. 10. 890. 1759.

*Oxybaphus violaceus* Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.

*Oxybaphus violaceus parviflorus* Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.

*Mirabilis violacea* Heimerl' Beitr. Syst. Nyct. 23. 1897.

*Allionia mollis* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

Stems few or numerous, slender, ascending or procumbent, 2–10 dm. long, much branched, the branches slender, green, bifariously puberulent or glabrate, sometimes viscid-pilose, the internodes much elongate; petioles slender, 1–6 cm. long, sparsely or densely pilose; leaf-blades mostly broadly ovate-deltoid, sometimes ovate-oblong or elongate-deltoid, 2–8 cm. long, 1.5–5 cm. wide, subcordate or truncate at the base, usually attenuate or long-attenuate at the apex, rarely obtuse or rounded, entire or subundulate, thin, bright-green, sparsely puberu-



lent or short-pilose or glabrate; inflorescence cymose, the cymes usually small and congested, or open in age, often leafy, the branches very slender, viscid-pilose; involucre few, on long or short, slender peduncles, about 3 mm. long in anthesis, in fruit 5–6 mm. long, green, viscid-pilose, the lobes triangular-ovate, unequal, usually acute or acuminate; perianth 6–8 mm. long, purplish-red, viscid-pilose; stamens usually 3, short-exserted; fruit obovoid, 3.5–4 mm. long, terete, dark-brown or blackish, short-pilose, sparsely and irregularly tuberculate; seed oval-obovoid, 2.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: Cumana, Venezuela.

DISTRIBUTION: Veracruz and Mexico (State) to Yucatán and Costa Rica; also in Colombia and Venezuela.

#### EXCLUDED SPECIES

*ALLIONIA CERVANTESII* (Sweet) Steud. Nom. Bot. ed. 2. 1: 50. 1840. (*Oxybaphus Cervantesii* Sweet, Brit. Fl. Gard. 1: pl. 81. 1825.) Described from cultivated plants said to have come from South America. The species has often been reported from Mexico, but no North American specimens seen by the writer agree with the original description and illustration.

*ALLIONIA CORDATA* (Kunze) Kuntze, Rev. Gen. 533. 1891. (*Oxybaphus cordifolius* Kunze; Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.) Reported doubtfully from Mexico by Choisy (in DC. Prodr. 13<sup>2</sup>: 432. 1849). The species appears to be exclusively South American.

*OXYBAPHUS OVATUS* (R. & P.) Vahl, Enum. 2: 41. 1806. (*Calyxhymenia ovata* R. & P. Fl. Per. 1: 45. 1798.) Reported doubtfully from Mexico by Choisy (in DC. Prodr. 13<sup>2</sup>: 431. 1849), but the specimens upon which the report was made were, undoubtedly, wrongly identified, the species being a South American one.

### 21. *ALLIONIELLA* Rydb. Bull. Torrey Club 29: 687. 1902.

Perennial herbs with dichotomous stems, the branches swollen at the nodes, more or less glandular-pubescent. Leaves opposite, petiolate, the blades broad, entire or nearly so. Flowers involucre 3-flowered, broadly campanulate at anthesis, nearly rotate when mature and slightly accrescent, green and calyx-like, 5-lobed, the lobes unequal, erect, imbricate; perianth short-funnelform, corolla-like, purplish-red, the tube short, stout, constricted above the ovary, the limb 5-lobed, induplicate-plicate. Stamens 3, unequal; filaments capillary, free; anthers didymous. Ovary ellipsoid; style filiform, exserted; stigma capitate. Anthocarp coriaceous, ellipsoid, smooth or obscurely transverse-ridged, glabrous. Seed with the testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Quamoclidion oxybaphoides* A. Gray.

#### 1. *Allioniella oxybaphoides* (A. Gray) Rydb. Bull. Torrey Club 29: 687. 1902.

*Quamoclidion oxybaphoides* A. Gray, Am. Jour. Sci. II. 15: 320. 1853.

*Mirabilis oxybaphoides* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Oxybaphus Wrightii* Hemsl. Biol. Centr. Am. Bot. 3: 3. 1882.

*Allionia oxybaphoides* Kuntze, Rev. Gen. 533. 1891.

*Mirabilis oxybaphoides glabrata* Heimerl, Ann. Cons. Jard. Genève 5: 180. 1901.

*Allioniella oxybaphoides glabrata* Standley, Contr. U. S. Nat. Herb. 12: 357. 1909.

Plants ascending or decumbent, from a thick fleshy root, much branched, usually forming dense clumps 4–12 dm. in diameter, the branches slender, green or whitish, densely viscid-villous with short hairs, or rarely glabrate, the internodes elongate; petioles slender or stout, 1–4 cm. long, viscid-villous or glabrate; leaf-blades deltoid-cordate or deltoid, often broadly so, 1.5–7 cm. long, 1.5–6 cm. wide, usually cordate at the base and broadly short-decurrent, sometimes truncate, acute to attenuate at the apex, often abruptly so, entire or undulate, thin, bright-green, viscid-villous, especially when young, or glabrate, ciliate; inflorescence cymose or axillary, the cymes few-flowered, leafy; peduncles slender, solitary, usually longer than the involucre, viscid-villous; involucre about 5 mm. long at anthesis and 1–1.5 cm. broad in age, viscid-villous, the lobes narrowly or broadly triangular, acute or attenuate,



very unequal, usually longer than the tube; perianth 7–10 mm. long, sparsely pilose or glabrate, the limb 6–8 mm. broad; fruit ellipsoid or subglobose, 2.5–3 mm. long, olivaceous, marked with small elongate black spots or slightly elevated transverse ridges.

TYPE LOCALITY: East of El Paso, Texas.

DISTRIBUTION: Dry stony or brushy hillsides, southern Colorado and Utah to Arizona and western Texas.

## 22. QUAMOCLIDION Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

Perennial herbs, with repeatedly dichotomous stems, glabrous or glandular-pubescent, the branches swollen at the nodes. Leaves opposite, petiolate, the blades broad, succulent, entire. Flowers involucre; involucre 3–8-flowered, campanulate, 4–5-lobed, calyx-like, green or colored, slightly accrescent in age, the lobes erect, imbricate; perianth funnelform or nearly tubular, corolla-like, purplish or deep-red, the tube slender or stout, constricted above the ovary, the limb 5-lobed, induplicate-plicate. Stamens 5, unequal; filaments capillary, incurved, connate at the base into a short fleshy cup; anthers didymous. Ovary ellipsoid; style filiform, exserted; stigma capitate, papillose. Anthocarp coriaceous, oblong or obovoid to ellipsoid, smooth or obscurely 5-angulate and rugulose, glabrous or puberulent. Seed with the testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Mirabilis triflora* Benth.

Perianth 2–2.5 cm. long, the limb scarcely broader than the tube; involucre 3-flowered; stamens long-exserted.

1. *Q. triflorum*.

Perianth 4–6 cm. long, the limb much broader than the tube; involucre with more than 3 flowers; stamens only slightly if at all exserted.

Fruit angulate, slightly tuberculate; plants glabrous throughout, or obscurely puberulent on the young peduncles.

2. *Q. Greenei*.

Fruit terete, smooth; plants copiously pubescent, at least on the stems.

Perianth glandular-villous outside; fruit olive and brown, with 10 light-colored vertical lines.

3. *Q. Froebelii*.

Perianth glabrous or sparsely puberulent; fruit dark-brown to black.

4. *Q. multiflorum*.

### 1. *Quamoclidion triflorum* (Benth.) Standley, Contr. U. S. Nat.

Herb. 12: 358. 1909.

*Mirabilis triflora* Benth. Pl. Hartw. 23. 1839.

*Quamoclidion nyctagineum* Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

Plants erect or decumbent, much branched, the branches slender or stout, densely viscid-puberulent; petioles slender, 6–30 mm. long; leaf-blades broadly cordate-ovate, or the uppermost narrowly cordate-ovate, 2.5–7.5 cm. long, 2.5–5.5 cm. wide, cordate at the base, acute to attenuate at the apex, usually abruptly so, thin, bright-green, viscid-puberulent when young, glabrate in age, the leaves of the inflorescence much reduced, bractlike; peduncles axillary or glomerate at the ends of the branches, 2–12 mm. long; involucre 4-lobed, 3-flowered, broadly campanulate, 8–12 mm. long, densely viscid-puberulent with short hairs, the lobes unequal, longer than the tube, broadly ovate, abruptly or gradually acute or attenuate; perianth deep-red, tubular, 2–2.5 cm. long, 4 mm. in diameter, densely viscid-puberulent, the limb not broader than the tube, shallowly and obtusely lobed; filaments exserted 7–12 mm.; fruit elliptic-oblong in outline, 5 mm. long, nearly black, rugulose.

TYPE LOCALITY: Bolaños, Jalisco.

DISTRIBUTION: Cape Region of Lower California, and Jalisco.

ILLUSTRATION: F. & P. Nat. Pfl. 3<sup>1b</sup>: f. 7, A.

### 2. *Quamoclidion Greenei* (S. Wats.) Standley, Contr. U. S. Nat.

Herb. 12: 358. 1909.

*Mirabilis Greenei* S. Wats. Proc. Am. Acad. 12: 253. 1876.

Plants erect or ascending, 4–6 dm. high, sparsely branched, glabrous throughout or sparsely and obscurely puberulent on the young peduncles, the branches stout, grayish-green; petioles stout, 0.4–3 cm. long; leaf-blades rhombic-orbicular, orbicular-ovate, or oblong-ovate, 4.5–7.5 cm. long, 2.5–6.5 cm. wide, broadly rounded to obtuse at the base and usually short-



decurrent, acute or obtuse to broadly rounded at the apex, thick and succulent, glaucescent; peduncles axillary or in terminal cymes, 1–5.5 cm. long, stout, the leaves of the inflorescence much reduced and bractlike, often deciduous; involucre campanulate, 2.5–4.5 cm. long, green or tinged with red, the 5 lobes equaling or shorter than the tube, broadly ovate or oval, obtuse to acute, usually abruptly apiculate; perianth 3.5–5 cm. long, purplish-red, glabrous, the tube 5–6 mm. in diameter, abruptly expanded into a shallowly 5-lobed limb 2.5–3 cm. broad; stamens equaling the perianth; fruit obovoid-oblong, 5 mm. long, nearly black, 5-angulate, rugulose, obscurely puberulent or glabrate.

TYPE LOCALITY: Mountain sides about Yreka, California.

DISTRIBUTION: In dry soil, northern California from Tehama County to Siskiyou County.

### 3. *Quamoclidion Froebelii* (Behr) Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Oxybaphus Froebelii* Behr, Proc. Calif. Acad. 1: 69. 1855.

*Mirabilis multiflora pubescens* S. Wats. Bot. Calif. 2: 2. 1880.

*Mirabilis Froebelii* Greene, Bull. Calif. Acad. 1: 124. 1885.

*Mirabilis multiflora Froebelii* M. E. Jones, Contr. West. Bot. 10: 49. 1902.

*Quamoclidion Froebelii glabratum* Standley, Contr. U. S. Nat. Herb. 12: 360. 1909.

*Mirabilis Froebelii glabrata* Jepson, Fl. Calif. 458. 1914.

Plants erect or ascending, 3–6 dm. high, much branched, the branches stout, densely short-villous and viscid throughout, or rarely glabrate; petioles stout, 0.3–3 cm. long; leaf-blades broadly deltoid-ovate, reniform-orbicular, rounded-ovate, or oblong-ovate, 4–10 cm long, 2–7.5 cm. wide, rounded to broadly cordate at the base and short-decurrent, rounded to acute at the apex, often abruptly acute or apiculate, thick and succulent, pale-green, densely short-villous or puberulent and viscid on both surfaces or rarely glabrate; peduncles numerous, 0.4–3.5 cm. long, solitary in the lower axils and cymosely clustered at the ends of the branches, the cymes usually very leafy, the subtending leaves often much reduced and bractlike; involucre campanulate, usually 6–8-flowered, 2.2–3.5 cm. long, densely short-villous and glandular-puberulent, the 5 lobes equaling or usually shorter than the tube, triangular to ovate-oblong, acute or obtuse; perianth purplish-red, 3.5–4.5 cm. long, short-villous and viscid outside, the tube 4–8 mm. in diameter, expanded into a shallowly 5-lobed limb 2–2.5 cm. broad; stamens equaling or slightly exceeding the perianth; fruit elliptic-oval in outline, narrowed at both ends, about 8 mm. long and 6 mm. in diameter, olive mottled with brown, marked with 10 vertical light-colored lines, smooth, glabrous.

TYPE LOCALITY: Near Warner's Ranch, southern California.

DISTRIBUTION: In dry sandy soil, western Nevada, southeastern California, and northern Lower California.

### 4. *Quamoclidion multiflorum* Torr.; A. Gray, Am. Jour. Sci. II. 15: 321. 1853.

*Oxybaphus multiflorus* Torr. Ann. Lyc. N. Y. 2: 237. 1827.

*Allionia multiflora* Eaton, Man. ed. 6. 11. 1833.

*Nyctaginia ? Torreyana* Choisy, in DC. Prodr. 13<sup>2</sup>: 430. 1849.

*Mirabilis multiflora* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Quamoclidion multiflorum glandulosum* Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Quamoclidion multiflorum obtusum* Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Mirabilis multiflora glandulosa* F. Macbr. Contr. Gray Herb. 49: 49. 1917.

*Mirabilis multiflora obtusa* F. Macbr. Contr. Gray Herb. 49: 49. 1917.

Plants erect or ascending, 3–6 dm. high, much branched, often forming clumps a meter in diameter, the branches usually stout, densely leafy, glaucous or glaucescent, obscurely puberulent or finely short-villous and viscid, often glabrate; petioles slender or stout, 0.4–3.5 cm. long; leaf-blades broadly ovate-deltoid to reniform-orbicular or ovate-oblong, 2.5–7.5 cm. long, 1.5–7.5 cm. wide, cordate to rounded at the base and often short-decurrent, broadly rounded and apiculate to very acute at the apex, thick and succulent, glaucescent, glabrous to puberulent or short-villous and viscid or glandular-puberulent; peduncles slender or stout, 0.5–6 cm. long, solitary in the axils and cymosely clustered at the ends of the branches, the leaves of the inflorescence reduced; involucre campanulate, usually 6–8 flowered, 1.6–3.5 cm. long, glabrous, glandular-puberulent, or short-villous and viscid, green or tinged with red,



the 5 lobes equaling or usually shorter than the tube, ovate-orbicular to triangular, rounded and apiculate to very acute; perianth purplish-red, 4–5.5 cm. long, glabrous or glandular-puberulent outside, the tube 4–7 mm. thick, expanding into a shallowly 5-lobed limb 2.5–3 cm. broad; stamens equaling the perianth or usually slightly exserted; fruit elliptic-oblong in outline, narrowed at both ends, 8–10 mm. long, dark-brown to nearly black, smooth, glabrous.

TYPE LOCALITY: About the forks of the Platte River, Colorado.

DISTRIBUTION: In dry, chiefly sandy soil, southern Utah and Colorado to northern Chihuahua and western Texas.

ILLUSTRATIONS: Bot. Mag. *pl.* 6266; Contr. U. S. Nat. Herb. 13: *pl.* 77; Clements, Rocky Mt. Fl. *pl.* 8, *f.* 2.

#### DOUBTFUL SPECIES

QUAMOCLIDION ANGULATUM Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849. (*Nyctago angulata* DC.; Choisy, in DC. Prodr. 13<sup>2</sup>: 429, as synonym. 1849.) Described from Mexico. The identity of the plant is problematical (see Standley, Contr. U. S. Nat. Herb. 13: 410. 1911).

### 23. HESPERONIA Standley, Contr. U. S. Nat. Herb. 12: 360. 1909.

Perennial herbs or shrubs, with repeatedly dichotomous stems, the nodes usually swollen, the plants usually pubescent and viscid. Leaves opposite, petiolate, or the upper sessile, the blades broad, succulent, entire or undulate. Flowers involucre, axillary; involucre 1-flowered, campanulate, only slightly accrescent in age, green, 5-lobed, the lobes slightly unequal, imbricate; perianth funnelform-campanulate, longer than the involucre, constricted above the ovary, the limb 5-lobed, induplicate-plicate, deciduous, the lobes retuse, red or white. Stamens 5, unequal; filaments capillary, incurved, connate at the base into a fleshy cup; anthers didymous. Ovary ellipsoid or globose; style filiform; stigma capitate, papillose. Anthocarp coriaceous, globose or oval, smooth, glabrous, often with 10 light-colored vertical lines. Seed with the testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the scanty endosperm; radicle elongate, descending.

Type species, *Mirabilis californica* A. Gray.

Fruit globose or depressed-globose, the diameter equaling or greater than the length.

Fruit oval or oblong to suborbicular in outline, the length greater than the diameter.

Involucral lobes lanceolate or oblong-lanceolate, longer than the tube.

Fruit 7–8 mm. long; involucre 9 mm. long.

Fruit 4–5 mm. long.

Involucre 7–9 mm. long; leaf-blades mostly 1.5–2.5 cm. long; plants usually slender, conspicuously viscid only about the inflorescence.

Involucre 10–13 mm. long; leaf-blades mostly 3–4 cm. long; plants very stout, very viscid throughout.

Involucral lobes broadly ovate to ovate-oblong, equaling or usually shorter than the tube.

Plants glabrous throughout, or with a few appressed hairs upon the involucre.

Plants conspicuously pubescent.

Pubescence scabrous, of very short conic hairs.

Pubescence chiefly of slender villous hairs, never of short conic hairs.

Stems villous nearly or quite throughout; blades of the lower leaves mostly rounded at the apex; perianth white or pinkish.

Stems villous only about the inflorescence if at all.

Perianth rose-colored or purplish-red; blades of the lower leaves obtuse or acutish at the apex, most of them narrowed to the apex and never rounded.

Perianth white or rarely pinkish; blades of the lower leaves usually all broadly rounded at the apex.

1. *H. Heimerlii*.

2. *H. oligantha*.

3. *H. polyphylla*.

4. *H. tenuiloba*.

5. *H. laevis*.

6. *H. cedrosensis*.

7. *H. Bigelovii*.

8. *H. californica*.

9. *H. retrorsa*.

#### 1. *Hesperonia Heimerlii* Standley, Contr. U. S. Nat. Herb. 13: 412. 1911.

Stems stout, the older ones white, much swollen at the nodes, much branched, the branches ascending or spreading, glabrous below, glandular-puberulent above, the internodes rather



long and the plants rather sparsely leafy; petioles stout, 3–15 mm. long; leaf-blades broadly deltoid-ovate to reniform-ovate, 1.5–3.5 cm. long, 1–3 cm. wide, obtuse to acutish at the apex, often apiculate, subcordate to truncate at the base, thick and fleshy, sparsely glandular-puberulent or scabrous, or in age glabrate, the blades of the upper leaves reduced, usually acute, short-petiolate; involucre numerous, short-pedunculate in the axils of the leaves or glomerate at the ends of the branches, 5–6 mm. long, densely viscid-puberulent, the lobes shorter than the tube, ovate, obtuse or acutish; perianth 10–12 mm. long, purplish-red, glandular-puberulent outside; stamens equaling the perianth; fruit globose or slightly depressed, 2.5–3 mm. long, dark-brown, obscurely rugulose.

TYPE LOCALITY: South end of Guadalupe Island, Lower California.

DISTRIBUTION: Guadalupe Island, Lower California.

2. *Hesperonia oligantha* Standley, Contr. U. S. Nat. Herb. 12: 363.  
1909.

Plants fruticose at the base, much branched, the branches slender, finely and sparsely puberulent or glabrate, the internodes 2.5–5 cm. long; petioles one third as long as the blades; leaf-blades deltoid-ovate, subcordate or rounded at the base, the lower ones rounded at the apex, the upper acute, sparsely puberulent; peduncles nearly as long as the involucre; involucre 9 mm. long, finely and densely viscid-puberulent, the lobes lance-triangular, acute, slightly longer than the tube; perianth about 12 mm. long; stamens long-exserted; fruit cylindric, acutish at both ends, 7–8 mm. long, almost 3 mm. thick, dark-brown, smooth.

TYPE LOCALITY: Calmalli, Lower California.

DISTRIBUTION: Known only from the type locality.

3. *Hesperonia polyphylla* Standley, Contr. U. S. Nat. Herb. 12: 364.  
1909.

Plants erect, suffrutescent at the base, about 5 dm. high, much branched, the branches slender or stout, glabrous below, glandular-puberulent above and sparsely villous; petioles slender or stout, 3–20 mm. long, the uppermost blades either long-petiolate or subsessile; leaf-blades orbicular-ovate to deltoid or narrowly ovate-deltoid, 1.5–3.5 cm. long, 1.2–3 cm. wide, subcordate to rounded at the base, acute to attenuate at the apex, the younger ones puberulent or short-villous, glabrate in age, thick and fleshy, the lateral veins often prominent; peduncles 2 mm. long or longer, sometimes equaling the involucre; involucre narrowly campanulate, 7–9 mm. long, densely short-villous and viscid, the lobes slightly unequal, usually exceeding the tube, lance-triangular, acute or attenuate; perianth 12–20 mm. long, the limb nearly as broad, glandular-puberulent outside, purplish-red; stamens included or slightly exserted; fruit oval in outline, 4 mm. long, 3 mm. thick, smooth, dark-brown, with 10 light-colored vertical lines.

TYPE LOCALITY: San Borge, Lower California.

DISTRIBUTION: Lower California and San Diego County, California.

4. *Hesperonia tenuiloba* (S. Wats.) Standley, Contr. U. S. Nat.  
Herb. 12: 363. 1909.

*Mirabilis tenuiloba* S. Wats. Proc. Am. Acad. 17: 375. 1882.

Plants erect, very stout, 3–6 dm. high, suffrutescent at the base, much branched, the branches very stout, whitish, densely short-villous or puberulent and viscid, the internodes mostly longer than the leaves, the nodes swollen; petioles stout, 2–7 mm. long, the upper blades subsessile; leaf-blades orbicular-deltoid, broadly deltoid-ovate, or rhombic-ovate, 2.5–4 cm. long, 1.3–3.5 cm. wide, subcordate or rounded at the base, acute or attenuate at the apex or the lower blades rarely obtuse, thick and fleshy, bright-green, densely viscid-puberulent, the upper leaves only slightly smaller than the lower; peduncles 2 mm. long or shorter, axillary, nearly concealed by the subtending leaves; involucre 10–13 mm. long, narrowly campanulate, densely short-villous and very viscid, the lobes slightly unequal, slightly exceeding the tube, narrowly lance-oblong, acute or attenuate; perianth 12–15 mm. long



(white ?), glandular-puberulent outside; stamens equaling the perianth; fruit oval in outline, 5 mm. long, 3.5 mm. in diameter, rounded at both ends, dark-brown, smooth.

TYPE LOCALITY: San Bernardino County, California.

DISTRIBUTION: In dry, sandy soil, Colorado Desert of southern California and northern Lower California.

5. *Hesperonia laevis* (Benth.) Standley, Contr. U. S. Nat. Herb.  
12: 363. 1909.

*Oxybaphus laevis* Benth. Bot. Voy. Sulph. 44. 1844.

*Mirabilis laevis* Curran, Proc. Calif. Acad. II. 1: 235. 1889.

*Quamoclidion laeve* Rydb. Bull. Torrey Club 29: 687. 1902.

Plants erect, suffrutescent below, much branched, glabrous throughout, or a few minute appressed hairs present on the involucre, the branches slender, with long internodes, whitish; petioles of the lower leaves almost as long as the blades, the blades of the uppermost leaves subsessile; leaf-blades orbicular-ovate or deltoid-ovate, 1.5–3.5 cm. long, 1–2 cm. wide, subcordate at the base, acutish or subobtusate at the apex, slightly sinuate, succulent, inconspicuously veined; peduncles very short, few; involucre 10 mm. long, the lobes about equaling the tube, ovate, acute; perianth about 15 mm. long; stamens exerted.

TYPE LOCALITY: Magdalena Bay, Lower California.

DISTRIBUTION: Vicinity of the type locality.

6. *Hesperonia cedrosensis* Standley, Contr. U. S. Nat. Herb.  
12: 362. 1912.

*Mirabilis cedrosensis* Jepson, Fl. Calif. 459. 1914.

Plants erect or ascending, 3–6 dm. high, suffrutescent or fruticose below, much branched, the branches slender, with long or short internodes, white or stramineous, glabrous below, scabrous above and sometimes viscid; petioles stout or slender, 3–13 mm. long, the uppermost blades subsessile; leaf-blades broadly deltoid, rhombic-ovate, or orbicular-ovate, 1.2–3 cm. long, 0.8–2.5 cm. wide, subcordate to rounded at the base, obtuse to acute at the apex, thick and succulent, scabrous with short conic retrorse hairs, or glabrate in age, the veins nearly obsolete, the blades of the upper leaves smaller, narrower, and more acute than those of the lower ones; peduncles few, 2 mm. long or wanting; involucre campanulate, 5–7 mm. long, densely covered with short viscid hairs, the lobes shorter than the tube, ovate or ovate-triangular, obtuse or acutish; perianth 12 mm. long, purplish-red, glabrous or sparsely puberulent; stamens about equaling the perianth; fruit subglobose but evidently longer than thick, 4.5–5 mm. long, smooth, dark-brown, with 10 light-colored vertical lines.

TYPE LOCALITY: Cedros Island, Lower California.

DISTRIBUTION: San Clemente Island, California; Cedros and San Benito islands and the western coast of Lower California.

7. *Hesperonia Bigelovii* (A. Gray) Standley.

*Mirabilis Bigelovii* A. Gray, Proc. Am. Acad. 21: 413. 1886.

*Mirabilis aspera* Greene, Erythea 4: 67. 1896.

*Mirabilis californica aspera* Parish, Muhlenbergia 3: 125. 1907.

*Hesperonia aspera* Standley, Contr. U. S. Nat. Herb. 12: 362. 1909.

*Hesperonia aspera villosa* Standley, Contr. U. S. Nat. Herb. 12: 363. 1909.

*Hesperonia glutinosa gracilis* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Hesperonia limosa gracilis* Standley, Muhlenbergia 5: 104. 1909.

Plants erect or ascending, 3–6 dm. high, suffrutescent at the base, much branched, the branches usually stout, whitish, densely villous with slender whitish hairs and somewhat viscid, rarely glabrate below in age; petioles stout, 5–12 mm. long, or those of the upper leaves shorter; blades of the lower leaves reniform-ovate, broadly rhombic-ovate, or suborbicular, 2–4 cm. long, 1.3–3.7 cm. wide, broadly rounded at the apex, or rarely narrowed to an obtuse apex, subcordate to rounded at the base, the blades of the upper leaves smaller, broadly oblong-ovate to deltoid-ovate, often acute, all copiously villous with slender whitish hairs and slightly viscid, or glabrate in age, thick and succulent, the veins nearly obsolete; peduncles numerous, axillary and glomerate at the ends of the branches, 5 mm. long or shorter; involucre campanu-



late, 5–6 mm. long, densely villous or short-villous and viscid, the lobes shorter than the tube, oblong-ovate or broadly ovate, obtuse or acutish; perianth 8–12 mm. long, white or sometimes pinkish, sparsely short-villous and viscid outside; stamens slightly exerted or occasionally included; fruit subglobose but evidently longer than thick, 5 mm. long, dark-olive or greenish-brown, marked by 10 lighter vertical lines.

TYPE LOCALITY: Grand Canyon of the Colorado, below Peach Spring, Arizona.

DISTRIBUTION: In dry, mostly sandy soil, southern and western Arizona, and in southeastern California, from Inyo County to San Diego County.

### 8. *Hesperonia californica* (A. Gray) Standley, Contr. U. S. Nat.

Herb. 12: 364. 1909.

*Oxybaphus glabrifolius crassifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 431. 1849.

*Oxybaphus glabrifolius* Torr. Pacif. R. R. Rep. 4: 131. 1857. Not *O. glabrifolius* Vahl, 1806.

*Mirabilis californica* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Oxybaphus californicus* Benth. & Hook. Gen. Pl. 3: 4. 1880.

*Hesperonia californica microphylla* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

Plants erect or decumbent, suffrutescent or fruticose below, much branched, the branches 2–10 dm. long, slender or stout, whitish, with short or elongate internodes, glabrous below, puberulent and viscid above and often villous but usually only sparsely so; petioles slender or stout, 12 mm. long or shorter, the uppermost blades often sessile; blades of the lower leaves subreniform to rounded-ovate or deltoid-ovate, 1.5–4.5 cm. long, 1–3.5 cm. wide, cordate to truncate at the base, narrowed to the obtuse or acute apex, the blades of the upper leaves smaller, narrower, mostly acute or attenuate, all the blades green, thick and succulent, short-villous or puberulent and viscid when young, glabrate in age; peduncles numerous, often crowded at the ends of the branches, 3 mm. long or shorter; involucre campanulate, 5–8 mm. long, densely short-villous and viscid, the lobes shorter than the tube, ovate or ovate-oblong, obtuse or acutish; perianth 10–14 mm. long, purplish-red, sparsely short-villous outside; stamens equaling or slightly exceeding the perianth; fruit broadly oval in outline, 5 mm. long, smooth, dark-brown.

TYPE LOCALITY: Southern California.

DISTRIBUTION: California, from the Santa Lucia Mountains to San Diego County, chiefly near the coast, and on the adjacent islands; northern Lower California.

ILLUSTRATION: Bot. Mex. Bound. Surv. pl. 48.

### 9. *Hesperonia retrorsa* (Heller) Standley.

*Mirabilis glutinosa* A. Nelson, Proc. Biol. Soc. Wash. 17: 92. 1904. Not *M. glutinosa* Kuntze. 1898.

*Mirabilis retrorsa* Heller, Muhlenbergia 2: 193. 1906.

*Hesperonia glutinosa* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Hesperonia glutinosa retrorsa* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Mirabilis limosa* A. Nelson, Bot. Gaz. 47: 426. 1909.

*Hesperonia limosa* Standley, Muhlenbergia 5: 104. 1909.

*Hesperonia limosa retrorsa* Standley, Muhlenbergia 5: 104. 1909.

*Mirabilis californica glutinosa* Jepson, Fl. Calif. 458. 1914.

*Mirabilis californica retrorsa* Jepson, Fl. Calif. 458. 1914.

Plants erect or ascending, suffrutescent at the base, much branched, the branches 3–6 dm. long, slender or stout, with usually elongate internodes, whitish, glabrous below, puberulent above with mostly retrorse hairs, usually slightly viscid and often sparsely short-villous; petioles stout, 5–12 mm. long, the uppermost blades often sessile; blades of the lower leaves ovate-orbicular, broadly deltoid-ovate, or suborbicular, 1.5–3.5 cm. long, 1–3 cm. wide, often as broad as long, subcordate or rounded at the base, usually broadly rounded at the apex but rarely narrowed and acutish, the blades of the upper leaves slightly smaller and narrower, obtuse to acute at the apex, all the blades green, thick and succulent, inconspicuously veined, scaberulous or puberulent with mostly retrorse hairs, glabrate in age; peduncles numerous, axillary and crowded at the ends of the branches, those in the lower axils sometimes 14 mm. long, the upper ones much shorter, often nearly obsolete; involucre campanulate, 5–7 mm. long, densely viscid-puberulent or short-villous, the lobes shorter than the tube, ovate to ovate-oblong, obtuse or acutish; perianth 10–12 mm. long, white, sparsely viscid-puberulent outside or glabrate; stamens equaling the perianth or slightly exerted; fruit



broadly oval in outline, 5–6 mm. long, smooth, dark-olive or brown, usually with 10 lighter vertical lines.

**TYPE LOCALITY:** In Owen's Valley in the extreme southern part of Mono County, California, near the Southern Belle Mine.

**DISTRIBUTION:** In dry, chiefly sandy soil, southwestern Utah and western Arizona, and in south-eastern California, from Inyo County to San Diego County.

## 24. *MIRABILIS* L. Sp. Pl. 177. 1753.

*Jalapa* (Tourn.) Mill. Gard. Dict. Abr. ed. 4. 1754.

*Nyctago* Juss. Gen. Pl. 90. 1789.

*Trimista* Raf. Aut. Bot. 12. 1840.

*Admirabilis* (Clusius) Nieuwl. Am. Midl. Nat. 3: 280. 1914.

Perennial herbs, more or less pubescent, with dichotomous stems and tuberous roots. Leaves opposite, petiolate or sessile, the blades broad, entire. Inflorescence axillary or of terminal, dense or open cymes; involucre 1-flowered, campanulate, calyx-like, 5-lobed, the lobes erect, imbricate, only slightly accrescent in age; perianth corolla-like, colored, tubular or tubular-funnelform, the tube slender, elongate, constricted above the ovary, the limb 5-lobed, induplicate-plicate, often not broader than the tube. Stamens 3 or 5; filaments unequal, exserted, capillary, incurved, connate at the base into a short cup; anthers didymous. Ovary ellipsoid or obovoid; style filiform, exserted; stigma capitate, papillose. Anthocarp coriaceous, angled or costate, more or less constricted at both ends, often tuberculate or rugulose, glabrous or pubescent. Seed with the testa adherent to the pericarp; embryo uncinat, enclosing the farinaceous endosperm; radicle elongate, descending.

Type species, *Mirabilis Jalapa* L.

Perianth tubular, the limb scarcely if at all broader than the tube.

Stamens 3; fruit puberulent.

Stamens 5; fruit glabrous.

Perianth 4–5 cm. long, not conspicuously dilated below; plants very viscid; fruit obscurely angled.

Perianth 2.5–3 cm. long, conspicuously dilated below; plants only slightly viscid; fruit sharply angled.

Perianth expanded into a broad limb much wider than the tube.

Perianth 2–2.2 cm. long, gradually dilated from the base to the mouth, purplish-red.

Perianth 3–17 cm. long, abruptly dilated into the limb.

Perianth 3–5.5 cm. long, normally purplish-red.

Perianth 7–17 cm. long, white tinged with pink or purple.

Plants short-villous and very viscid, at least about the inflorescence; leaf-blades short-petiolate, the upper ones subsessile.

Plants puberulent, slightly or not at all viscid; leaf-blades, even the uppermost, conspicuously petiolate.

1. *M. Watsoniana*.

2. *M. exserta*.

3. *M. Pringlei*.

4. *M. Urbani*.

5. *M. Jalapa*.

6. *M. longiflora*.

7. *M. Wrightiana*.

### 1. *Mirabilis Watsoniana* Heimerl, Bot. Jahrb. 11: 84. 1889.

Plants erect, much branched, densely leafy, the branches puberulent above, glabrate below; lower leaves long-petiolate, the uppermost subsessile, the blades ovate-deltoid, cordate or truncate at the base and short-decurrent, acute or acuminate at the apex, thin, green, glabrous, ciliate; peduncles slender, short-villous, cymosely glomerate at the ends of the branches, tubular-campanulate, unequally 5-lobed, short-villous, slightly accrescent in age; perianth tubular, short-villous below, gradually dilated upward, the limb scarcely broader than the tube, 5-lobed; stamens 5, subequal, long-exserted; fruit small, obovoid-pyramidal, dark-brown, constricted at both ends, 5-angled, the angles subtuberculate, the sides smooth, puberulent, slightly viscid when moistened.

**TYPE LOCALITY:** Cuesta de Sololá, Guatemala.

**DISTRIBUTION:** Known only from the type locality.

**ILLUSTRATION:** Bot. Jahrb. 11: pl. 2, f. 2a–2h.

### 2. *Mirabilis exserta* Brand. Proc. Calif. Acad. II. 3: 165. 1891.

Plants erect, 4–6 dm. high, much branched, the branches slender, densely viscid-puberulent, or glabrate below; petioles slender, 1–2.5 cm. long; leaf-blades rhombic-orbicular, ovate-orbicular, broadly ovate-deltoid, or oval-ovate, 6–11 cm. long, 4–10.5 cm. wide, subcordate



7. **Boerhaavia tenuifolia** A. Gray; Coult. Contr. U. S. Nat. Herb.  
2: 355. 1894.

*Boerhaavia linearifolia glabrata* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

Perennial, from a woody base, sparsely branched, the branches 2–4 dm. long, very slender, glaucous, glabrous below, sometimes obscurely scaberulous above; petioles stout, 1–2 mm. long; leaf-blades linear, 1–2.5 cm. long, 1.5 mm. broad, coriaceous, glaucous, glabrous, the margins strongly revolute; inflorescence cymose, axillary and terminal, much branched, the branches viscid-puberulent, the flowers numerous, on pedicels 1–2 mm. long; bracts minute, ovate or lanceolate, abruptly attenuate, minutely puberulent or glabrate; perianth purplish-red, 8–10 mm. broad, puberulent outside; stamens 3; fruit obovoid, rounded at the apex, 5-angulate, 2.5–3 mm. long, glabrous, the angles broad and smooth, the sulci between them smooth.

TYPE LOCALITY: Camp Charlotte, Ixion County, Texas.

DISTRIBUTION: Dry hillsides, western Texas.

8. **Boerhaavia Lindheimeri** Standley, sp. nov.

*Boerhaavia linearifolia glandulosa* Standley, Contr. U. S. Nat. Herb. 12: 387. 1909. Not *B. glandulosa* Anderss. 1854.

Perennial, from a thick woody root, the stems several or numerous, ascending or procumbent, sparsely branched, the branches stout, divergent or ascending, densely glandular-hirsute and glandular-puberulent below, densely glandular-puberulent above, the internodes mostly longer than the leaves; petioles 1–3 mm. long; leaf-blades lance-linear, lanceolate, or linear, broadest at the base and gradually narrowed upward, 1.5–4 cm. long, 2–10 mm. wide, rounded or obtuse at the base, acute to acuminate at the apex, thinly coriaceous, green above, pale beneath and brown-spotted, glandular-hirtellous or in age glabrate; inflorescence cymose, much branched, nearly naked, the slender branches glandular-puberulent, the flowers solitary, on pedicels 1–3 mm. long; bracts minute, persistent, lanceolate, attenuate, brown-dotted; perianth purplish-red, 7–9 mm. long and broad, puberulent outside; stamens 5; fruit obovoid-oblong, rounded at the apex, 3 mm. long, glabrous, 5-angulate, the angles rounded, smooth, the narrow sulci smooth.

TYPE LOCALITY: Texas.

DISTRIBUTION: Southwestern Texas.

9. **Boerhaavia linearifolia** A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

*Boerhaavia tenuifolia* Standley, Contr. U. S. Nat. Herb. 12: 386, in part. 1909. Not *B. tenuifolia* A. Gray, 1894.

Perennial, from a thick woody root; stems numerous, ascending or procumbent, 1–4 dm. long, much branched, the branches slender, gray or white, hirsute or hirtellous and glandular-puberulent below, densely glandular-puberulent above; petioles stout, 1–3 mm. long; leaf-blades linear to lanceolate, rarely narrowly triangular, 1.2–3.5 cm. long, 2–7 mm. wide, obtuse to rounded at the base and often unequal, broadest at the base and usually tapering gradually to the obtuse or acute apex, coriaceous, usually glaucous, at least beneath, hirsute or hirtellous when young, glabrate in age, spotted with brown beneath; inflorescence cymose, much branched, naked or nearly so, the slender branches ascending or divergent, glandular-puberulent, the numerous flowers subsessile or on pedicels 1–3 mm. long, the bracts minute, persistent, ovate or lanceolate, acuminate or attenuate, brown-dotted; perianth purplish-red, 7–8 mm. long, about 1 cm. broad, puberulent outside; stamens 5; fruit obovoid-oblong, 2.5–3 mm. long, glabrous, 5-angulate, the angles broad, rounded, smooth, the broad or narrow sulci smooth.

TYPE LOCALITY: Western Texas.

DISTRIBUTION: Dry, rocky hillsides, western Texas and southeastern New Mexico to Coahuila.

10. **Boerhaavia purpurascens** A. Gray, Am. Jour. Sci. II. 15: 321.  
1853.

Erect annual, 2–5 dm. high, much branched below, the branches slender, brown-punctate, puberulent below, densely viscid-villous or glandular-hirtellous above; petioles slender, 0.4–



2.2 cm. long; leaf-blades oval to oblong, suborbicular, or ovate, or the uppermost lanceolate or linear-oblong, 1.2–3 cm. long, 0.7–2 cm. wide, rounded or obtuse at the base, broadly rounded to very acute at the apex, often apiculate, entire or subsinuate, thin, bright-green above, paler beneath, often brown-punctate, glabrous or obscurely puberulent; inflorescence cymose-paniculate, sparsely branched, the branches ascending, densely glandular-villous with short hairs, the flowers short-pedicellate or sessile, densely cymose-glomerate at the ends of long slender peduncles; bracts oblong or obovate, equaling or exceeding the fruit, persistent, thin, purplish-red, villous and long-ciliate; perianth 3–4 mm. long, pink, glandular-punctate; stamens 3, equaling the perianth; fruit obovoid, 2.5–3 mm. long, rounded at the apex, acute at the base, stramineous, glabrous, 5-angulate, the angles low, acute, smooth, the sulci broad, smooth.

TYPE LOCALITY: Stony hills near Santa Rita, New Mexico.

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to southeastern Arizona and Sonora.

11. *Boerhaavia pterocarpa* S. Wats. Proc. Am. Acad. 17: 376. 1882.

Erect or decumbent annual, 1–3 dm. high, sparsely branched, the branches slender, ascending, puberulent, often brown-punctate; petioles slender, 2–12 mm. long; leaf-blades broadly ovate-rhombic to ovate or lanceolate, 1–2.5 cm. long, 0.3–1.5 cm. wide, rounded or obtuse at the base, rounded to attenuate at the apex, entire or subsinuate, thin, green above, slightly paler beneath, glabrous or sparsely puberulent; inflorescence of few terminal and axillary, densely many-flowered, headlike cymes borne on slender peduncles 1–3 cm. long, the flowers on stout pedicels 1 mm. long or shorter; bracts minute, lanceolate, brown-punctate, persistent or deciduous; perianth pink, 1–1.5 mm. long, glandular-punctate; stamens included; fruit broadly obpyramidal, 3 mm. long, truncate at the apex, abruptly contracted into a short stipe below, glabrous, 3- or 4-winged, the wings narrow, gradually tapering downward, thin, smooth, the body of the fruit strongly transverse-rugulose.

TYPE LOCALITY: Apache Pass, Arizona.

DISTRIBUTION: Southeastern Arizona and adjacent Sonora.

12. *Boerhaavia megaptera* Standley, Contr. U. S. Nat. Herb. 12: 379. 1909.

Erect annual, 3–6 dm. high, much branched, the branches slender, ascending, puberulent, tinged with red, brown-punctate, the middle and upper internodes with viscous rings; petioles slender, 0.4–2 cm. long; leaf-blades broadly ovate to oblong, ovate-oblong, or linear-lanceolate, 2–4 cm. long, 0.4–1.7 cm. wide, subcordate to rounded at the base, obtuse to long-attenuate at the apex, entire or subsinuate, glabrous or obscurely puberulent, green above, pale beneath, sparsely brown-punctate; inflorescence cymose-paniculate, much branched, the branches slender, ascending, the flowers on pedicels 1–2 mm. long, umbellate at the ends of short slender peduncles; bracts minute, thin, ovate or lanceolate, brown-punctate, persistent; perianth 1–1.5 mm. long, pink, glandular-punctate; stamens included; fruit 3–4 mm. long, 2–3 mm. broad, truncate at the apex, acutish at the base, glabrous, 5-winged, the wings thin, smooth, the very narrow sulci smooth.

TYPE LOCALITY: On Flattop Mountain, Tucson Mountains, Arizona, at an altitude of 850 meters.

DISTRIBUTION: Vicinity of the type locality.

13. *Boerhaavia alata* S. Wats. Proc. Am. Acad. 24: 69. 1889.

Erect or decumbent annual, 3–6 dm. high, much branched, the branches slender, stramineous, minutely puberulent below, glabrous above, brown-punctate, the middle internodes with viscous rings; petioles slender, 2–8 mm. long; leaf-blades ovate-oblong to lance-oblong, or the uppermost oblong-linear, 2–3.5 cm. long, 2–12 mm. broad, rounded to broadly cuneate at the base, obtuse or acute at the apex, entire, green above, pale beneath, glabrous, sparsely brown-punctate; inflorescence laxly cymose-paniculate, much branched, the branches slender, glabrous, the flowers on pedicels 2–15 mm. long, solitary or umbellate in clusters of 7 or fewer; bracts



minute, lanceolate, brown-punctate, persistent; perianth 3 mm. long, pink, glandular-punctate; stamens 5, included; fruit 4 mm. long and nearly as broad, rounded at the base, emarginate at the apex, glabrous, 5-winged, the wings broad, thin, the body coarsely transverse-rugulose.

TYPE LOCALITY: On a small rocky island in Guaymas harbor, Sonora.

DISTRIBUTION: Vicinity of the type locality.

14. *Boerhaavia triquetra* S. Wats. Proc. Am. Acad. 24: 69. 1889.

Ascending or procumbent annual, 3–6 dm. high much branched, the branches slender, yellowish-green or stramineous, minutely puberulent, the upper internodes with viscous rings; petioles slender, 0.3–1.7 cm. long; leaf-blades oblong-oval to ovate-oblong or lanceolate, 1.5–4 cm. long, 0.4–1.5 cm. wide, rounded or obtuse at the base, obtuse to attenuate at the apex, entire, thick and firm, green above, pale beneath, glabrous, epunctate; inflorescence rather densely cymose, much branched, the branches slender, glabrous, erect or ascending, the flowers on pedicels 1–3 mm. long, in clusters of 2 or 3 at the ends of short slender peduncles; bracts minute, ovate or lanceolate, glandular-punctate, persistent; perianth pink, 1 mm. long, glabrous, brown-punctate; stamens 2, included; fruit obpyramidal, 2–2.5 mm. long, 1.2 mm. broad, truncate at the apex, glabrous, yellowish-green, 3- or 4-angulate, the angles very acute, smooth, the broad sulci coarsely rugulose.

TYPE LOCALITY: Sandy plains and stony ridges about Los Angeles Bay, Lower California.

DISTRIBUTION: Known only from the type locality.

15. *Boerhaavia maculata* Standley, Contr. U. S. Nat. Herb. 12: 379. 1909.

Erect annual, 2–6 dm. high, much branched below, the branches slender, brown-punctate, cinereo-puberulent, some of the upper internodes viscous; petioles slender, 3–12 mm. long; leaf-blades narrowly oblong to lanceolate or linear, 1.2–6 cm. long, 0.2–1.1 cm. wide, rounded or obtuse at the base, acuminate to long-attenuate at the apex, entire, sparsely puberulent or glabrous, green above, pale beneath, brown-punctate on both sides; inflorescence loosely cymose-paniculate, much branched, the branches slender, erect or ascending, the flowers on pedicels 2–10 mm. long, simply umbellate at the ends of long slender peduncles; bracts minute, lanceolate, persistent, brown-punctate; perianth pink, 3 mm. long, 6–7 mm. broad, glabrous, glandular-punctate; stamens 5, exserted; fruit obpyramidal, truncate at the apex, 3.5–4 mm. long, 2–2.5 mm. broad, stramineous, glabrous, 5-angulate, the angles very broad, much compressed, acute, slightly rugose, the narrow sulci strongly rugose.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Dry, rocky hillsides, coast of southern Sonora and northern Sinaloa.

16. *Boerhaavia erecta* L. Sp. Pl. 3. 1753.

*Boerhaavia elongata* Salisb. Prodr. 56. 1796.

*Boerhaavia virgata* H. B. K. Nov. Gen. & Sp. 2: 215. 1817.

*Boerhaavia discolor* H. B. K. Nov. Gen. & Sp. 2: 215. 1817.

*Boerhaavia atomaria* Raf. Aut. Bot. 40. 1840.

*Valeriana latifolia* Mart. & Gal. Bull. Acad. Brux. 11: 124. 1844.

*Boerhaavia Thornberi* M. E. Jones, Contr. West. Bot. 12: 72. 1908.

*Boerhaavia erecta Thornberi* Standley, Contr. U. S. Nat. Herb. 12: 381. 1909.

Annual, erect or decumbent, 2–10 dm. high, much branched at the base and sparsely above, the branches stout or slender, often tinged with red, finely puberulent below, the middle internodes often with brown viscous bands, the uppermost internodes glabrous or minutely puberulent; petioles slender, 0.4–4 cm. long; leaf-blades mostly broadly ovate-rhombic or deltoid-ovate, but sometimes oval, broadly oblong, or ovate, 2–6 cm. long, 1–4.5 cm. wide, truncate to rounded at the base, broadly rounded to obtuse or rarely acute at the apex, entire or usually subsinuate, bright-green above, beneath paler or glaucous and usually brown-punctate, glabrous, or ciliolate or sparsely puberulent, the blades of the uppermost leaves smaller, lanceolate to linear; inflorescence cymose, much branched, the branches slender, erect or ascending, usually glabrous, rarely with viscous internodes, the flowers irregularly umbellate-cymose or subracemose at the ends of long slender peduncles, the pedicels 1–5 mm.



long; bracts minute, linear or lanceolate, reddish, persistent; perianth white or tinged with pink, 1–1.5 mm. long, glabrous, sometimes glandular-punctate; stamens 2 or 3, exserted; fruit narrowly obpyramidal, 3–3.5 mm. long, 1–1.5 mm. broad at the truncate apex, green, glabrous, 5-angled, the angles obtuse or acutish, smooth, the sulci coarsely transverse-rugose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: South Carolina to Florida, Arkansas, and southern Arizona, and southward throughout Mexico, Central America, and the warmer parts of South America; general in the West Indies.

ILLUSTRATIONS: Jacq. Hort. Vindob. *pl.* 5, 6; Gaertn. Fruct. *pl.* 127.

17. *Boerhaavia intermedia* M. E. Jones, Contr. West. Bot. 10: 41.  
1902.

*Boerhaavia universitatis* Standley, Contr. U. S. Nat. Herb. 12: 380. 1909.

Erect or procumbent annual, 2–5 dm. high, much branched, the branches slender, ascending, minutely puberulent, often brown-punctate or tinged with red, the middle and upper internodes usually with viscous rings; petioles slender, 0.3–2.5 cm. long; blades of the lower leaves mostly oval or broadly oblong, rarely oval-ovate or suborbicular, the others oblong to ovate, lanceolate, or linear, 1.5–4.5 cm. long, 0.3–1.5 cm. wide, rounded or obtuse at the base, broadly rounded to long-attenuate at the apex, rather thin, glabrous or when young obscurely puberulent, entire or subsinuate, green above, paler or often white beneath, frequently brown-punctate, especially on the upper leaves; inflorescence cymose-paniculate, much branched, the branches slender, ascending, the internodes usually with viscous rings, the flowers on slender pedicels 1–3 mm. long, in few-flowered, usually simple umbels at the ends of long slender peduncles; bracts minute, lanceolate, glandular-punctate, persistent; perianth 1.5–2 mm. long, pink, often glandular-punctate; stamens 2 or 3, equaling or slightly exceeding the perianth; fruit narrowly obpyramidal, 2.5–2.7 mm. long, yellowish-green or stramineous, glabrous, truncate at the apex, 5-angulate, the angles smooth, obtuse, the narrow sulci transverse-rugulose.

TYPE LOCALITY: El Paso, Texas.

DISTRIBUTION: Dry plains and fields, western Texas to southeastern California, south to Lower California, Durango, and Coahuila.

ILLUSTRATION: M. E. Jones, Contr. West. Bot. 10: *pl.* 16.

18. *Boerhaavia lateriflora* Standley, Contr. U. S. Nat. Herb.  
13: 426. 1911.

Erect or procumbent annual, 1–5 dm. high, much branched, the branches slender, greenish, minutely puberulent, slightly or not at all viscous; petioles very slender, 0.3–3 cm. long; leaf-blades broadly ovate-rhombic to ovate, oval, oblong, or lance-oblong, or the uppermost linear, 1.5–5.5 cm. long, 1–2.5 cm. wide, or those of the inflorescence only 2 mm. wide, rounded at the base, rounded to attenuate at the apex, entire or subsinuate, thin, green above, slightly paler beneath, glabrous or obscurely puberulent; inflorescence cymose-paniculate or wholly of axillary and terminal simple peduncles, the flowers sessile or short-pedicellate, in dense headlike cymes; bracts minute, lanceolate, thin, persistent, sometimes glandular-punctate; perianth pink, 2–3 mm. long, glabrous; stamens 3, exserted; fruit 2.5 mm. long, narrowly obpyramidal, truncate at the apex, glabrous, 5-angulate, the angles obtuse, slightly rugulose, the sulci broad, strongly rugulose.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Vicinity of the type locality.

19. *Boerhaavia Wrightii* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

*Boerhaavia bracteosa* S. Wats. Proc. Am. Acad. 20: 370. 1885.

Erect annual, 2–6 dm. high, much branched, the branches slender or stout, ascending, densely puberulent below and often short-villous, densely glandular-puberulent and villous above; petioles slender or stout, 0.5–2 cm. long; leaf-blades ovate, ovate-oblong, oval, narrowly oblong, or lanceolate, or the uppermost linear, 2–4.5 cm. long, 0.3–2.5 cm. wide, truncate or rounded at the base, obtuse or rounded to long-attenuate at the apex, sinuate or entire, rather



thin, green above, paler beneath, brown-punctate, puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glandular-puberulent, viscid-villous, or glandular-hirtellous, the flowers on pedicels about 1 mm. long, in dense or somewhat interrupted racemes, these with glabrous rachises; bracts about as long as the fruit, persistent, ovate-orbicular or ovate, abruptly acuminate or long-cuspidate, very thin, purplish, short-villous and ciliate; perianth pink, 1.5 mm. long; stamens 3 or 4, included; fruit broadly oblong, rounded at the apex, 2 mm. long and over 1 mm. thick, glabrous, usually 4-angulate, the angles broad, acute, smooth, the sulci broad, rugulose.

TYPE LOCALITY: Pebbly hills near El Paso [Texas or Chihuahua].

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to Nevada, and southward to Sonora.

20. *Boerhaavia Rosei* Standley, Contr. U. S. Nat. Herb. 13: 424.  
1911.

Erect annual, 5 dm. high, much branched, the branches slender, ascending or spreading, puberulent, above densely glandular-puberulent or glandular-hirtellous; petioles rather stout, 5–12 mm. long; leaf-blades ovate, ovate-oval, or oval, the uppermost often lanceolate, 1.2–2.2 cm. long, 0.4–1.2 cm. wide, rounded at the base, obtuse to very acute at the apex, entire or subsinuate, thin, green above, paler beneath, glabrous or sparsely puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, the internodes usually viscous, the flowers on stout pedicels 1 mm. long or shorter, in long slender interrupted racemes; bracts minute, thin, lanceolate, ciliolate, deciduous; perianth pink, 1 mm. long, glabrous; stamens included; fruit narrowly obpyramidal, 2.5 mm. long, truncate at the apex, glabrous, green, 5-angulate, the angles smooth, acute, the sulci broad, open, smooth or obscurely rugulose.

TYPE LOCALITY: In sandy soil along the Río Fuerte near Fuerte, Sinaloa.

DISTRIBUTION: Known only from the type locality.

21. *Boerhaavia alamosana* Rose, Contr. U. S. Nat. Herb. 1: 110.  
1891.

Erect annual, 3–5 dm. high, much branched, the branches slender, ascending, puberulent and sparsely hirtellous; petioles slender 3–8 mm. long; leaf-blades lanceolate or linear-lanceolate, 1.2–3.3 cm. long, 3–5 mm. wide, rounded at the base, acute to long-attenuate at the apex, entire or subsinuate, green above, pale beneath, brown-punctate, puberulent; inflorescence cymose-paniculate, much branched, the branches slender, ascending, glabrous, the flowers on pedicels 1–2 mm. long, in short, slender, remotely flowered racemes; bracts lanceolate, thin, ciliolate, brown-punctate, shorter than the flowers, deciduous; perianth 3 mm. long, white, glabrous or puberulent; stamens 4, exserted; fruit obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, rounded, smooth, the sulci narrowly linear, nearly closed, smooth.

TYPE LOCALITY: Hillsides about Alamos, Sonora.

DISTRIBUTION: Known only from the type locality.

22. *Boerhaavia Coulteri* (Hook. f.) S. Wats. Proc. Am. Acad.  
24: 70. 1889.

*Senkenbergia Coulteri* Hook. f.; Benth. & Hook. Gen. Pl. 3: 6, hyponym. 1880.

*Boerhaavia spicata Palmeri* S. Wats. Proc. Am. Acad. 24: 70. 1889.

*Boerhaavia Watsoni* Standley, Contr. U. S. Nat. Herb. 12: 384. 1909.

Erect or decumbent annual, 2–8 dm. high, much branched, the branches slender, ascending, green or stramineous, puberulent, often sparsely villous or hirtellous above; petioles slender, 0.5–2 cm. long; leaf-blades broadly ovate-rhombic, oval, oblong, deltoid-ovate, ovate, or lanceolate, 1.5–5 cm. long, 0.5–2.2 cm. wide, rounded at the base, rounded to very acute at the apex, thin, entire or sinuate, green above, pale beneath, glabrous or sparsely puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, usually with viscid internodes, the flowers on pedicels 1 mm. long or shorter, in slender interrupted



racemes; bracts usually shorter than the ovary, lanceolate or ovate, thin, brown-punctate, obscurely ciliolate; perianth 1–1.5 mm. long, pink or white, glabrous; stamens 1 or 2, included; fruit narrowly obovoid, 2.5–3 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, obtuse, smooth, the sulci narrowly linear, closed, smooth.

TYPE LOCALITY: Mexico.

DISTRIBUTION: In dry, sandy soil, Arizona and southeastern California to Lower California and Sonora.

**23. *Boerhaavia Xanti* S. Wats. Proc. Am. Acad. 24: 69. 1889.**

*Boerhaavia fallax* Standley, Contr. U. S. Nat. Herb. 13: 424. 1911.

Erect or decumbent annual, 2–4 dm. high, much branched, the branches slender, stramineous or light-green, puberulent and villous or hirtellous below; petioles slender, 0.5–2.5 cm. long; leaf-blades ovate-rhombic, oval, oblong, oblong-ovate, narrowly oblong, or lanceolate, 2–5 cm. long, 0.5–3 cm. wide, subcordate to obtuse at the base, rounded to attenuate at the apex, entire or usually sinuate, thin, green above, paler beneath, often brown-punctate, glabrous or puberulent; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, often with viscous internodes, the flowers on pedicels 1 mm. long, in short, dense or interrupted racemes; bracts small, lanceolate or ovate, deciduous, thin, often ciliolate, shorter than the flowers; perianth pink, 3 mm. long, glabrous; stamens 3 or 4, exserted; fruit broadly obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles broad, acute, smooth, the sulci broad, transverse-rugulose.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Southern Lower California and western Sonora.

**24. *Boerhaavia Torreyana* (S. Wats.) Standley, Contr. U. S. Nat. Herb. 12: 385. 1909.**

*Boerhaavia spicata* Torr. Bot. Mex. Bound. Surv. 171. 1859. Not *B. spicata* Choisy, 1849.

*Boerhaavia spicata Torreyana* S. Wats. Proc. Am. Acad. 24: 70. 1889.

Erect or procumbent annual, 2–6 dm. high, much branched, the branches slender or stout, puberulent below and sometimes sparsely glandular-hirtellous, above puberulent and hirtellous, sometimes viscid; petioles slender, 0.5–2.5 cm. long; leaf-blades deltoid-ovate, oval, oblong, rhombic-ovate, or ovate, or the uppermost narrowly lanceolate, 1.7–4.5 cm. long, 0.4–2.5 cm. wide, truncate to obtuse at the base, rounded to very acute at the apex, entire or usually sinuate, green above, paler beneath, usually brown-punctate, puberulent or glabrate; inflorescence cymose-paniculate, much branched, the branches slender, glabrous but mostly with viscous internodes, the flowers on slender pedicels 1–2 mm. long, in slender, remotely flowered racemes; bracts small, deciduous, usually lanceolate, thin, brown-punctate, ciliolate, commonly shorter than the ovary at anthesis; perianth pink, glabrous or puberulent, 1–1.5 mm. long; stamens 1 or 2, included; fruit narrowly obovoid, 2.5 mm. long, rounded at the apex, acuminate at the base, glabrous, stramineous, 5-angulate, the angles thin, acute, often rugulose, the sulci broad and open, rugulose.

TYPE LOCALITY: Not definitely stated.

DISTRIBUTION: Dry, gravelly plains and hillsides, western Texas to Arizona, south to Coahuila.

**25. *Boerhaavia spicata* Choisy, in DC. Prodr. 13<sup>2</sup>: 456. 1849.**

*Boerhaavia Palmeri* S. Wats. Proc. Am. Acad. 24: 69. 1889. Not *B. Palmeri* S. Wats. 1883.

Erect or procumbent annual, 2–6 dm. high, much branched, the branches stout, usually tinged with red, densely viscid-puberulent, often villous above; petioles stout, 0.5–3.5 cm. long; leaf-blades ovate or lanceolate, or sometimes oblong, ovate-deltoid, or narrowly lanceolate, 1–4.5 cm. long, 0.4–2 cm. wide, truncate to obtuse at the base, obtuse to attenuate at the apex, entire or often deeply sinuate, rather thin, green above, pale beneath, viscid-puberulent or sparsely short-villous, usually brown-punctate; inflorescence cymose-paniculate, much branched, the branches slender, glabrous, with viscous internodes, the flowers on pedicels 1–2 mm. long, in short dense racemes; bracts broadly ovate, pink, thin, often as long as the flowers, ciliate, deciduous; perianth 1–1.5 mm. long, pink, puberulent or glabrous; stamens



1 or 2, included; fruit obovoid, 2.5 mm. long, rounded at the apex, acute at the base, glabrous, 5-angulate, the angles thick, acute, smooth, the sulci broad, open, rugose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: In dry, sandy soil, southern Arizona to Chihuahua and Sinaloa.

**17. CYPHOMERIS** Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Lindenia* Mart. & Gal. Bull. Acad. Brux. 10<sup>1</sup>: 357. 1843. Not *Lindenia* Benth. 1842.

*Tinantia* Mart. & Gal. Bull. Acad. Brux. 11<sup>1</sup>: 240. 1844. Not *Tinantia* Scheidw. 1839.

*Senkenbergia* Schauer, Linnaea 19: 711. 1847. Not *Senkenbergia* Gaertn. Mey. & Scherb. 1800.

Erect or ascending perennial herbs, suffrutescent at the base, more or less pubescent, much branched, the upper internodes each with a glutinous area along the middle. Leaves opposite, those of a pair subequal, petiolate, the blades broad or narrow, succulent, entire or sinuate. Flowers perfect, in elongate, spikelike, terminal and axillary racemes, pedicellate, each pedicel subtended by a narrow caducous bract; perianth broadly tubular-funnelform, deep bright-red, the tube very short, slightly curved, constricted above the ovary, the limb somewhat oblique, shallowly 5-lobed, induplicate-plicate. Stamens 5; filaments capillary, exserted, unequal, connate at the base; anthers didymous. Ovary fusiform, asymmetric; style filiform, exserted; stigma capitate. Anthocarp clavate, stipitate, gibbous, pendent or refracted, finely striate vertically, glabrous. Seed with a thin testa adherent to the pericarp; embryo uncinat, the broad cotyledons enclosing the farinaceous endosperm, the radicle elongate, descending.

Type species, *Lindenia gypsophiloides* Mart. & Gal.

Fruit 10–12 mm. long; leaf-blades glabrous, or sparsely puberulent when young, the upper most usually linear or nearly so.

Fruit about 7 mm. long; leaf-blades permanently and densely puberulent, the upper ones nearly as broad as the lower.

1. *C. gypsophiloides*.

2. *C. crassifolia*.

**1. Cyphomeris gypsophiloides** (Mart. & Gal.) Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Lindenia gypsophiloides* Mart. & Gal. Bull. Acad. Brux. 10<sup>1</sup>: 358. 1843.

*Tinantia gypsophiloides* Mart. & Gal. Bull. Acad. Brux. 11<sup>1</sup>: 240. 1844.

*Senkenbergia annulata* Schauer, Linnaea 19: 711. 1847.

*Boerhaavia gibbosa* Pavon; Choisy, in DC. Prodr. 13<sup>2</sup>: 457. 1849.

*Senkenbergia gypsophiloides* Benth. & Hook. Gen. Pl. 3: 5. 1880.

*Boerhaavia gypsophiloides* Coult. Contr. U. S. Nat. Herb. 2: 354. 1894.

Plants erect or ascending, 3–10 dm. high, suffrutescent at the base, much branched, the branches slender, glaucous, glabrous, or rarely obscurely puberulent below; petioles slender, 0.5–2.5 cm. long; leaf-blades narrowly deltoid, lanceolate, deltoid-oblong, or ovate-deltoid, the upper ones usually linear, 2.5–7 cm. long, 0.3–3 cm. wide, subcordate to acute at the base, gradually narrowed to an acute or obtuse apex, entire or rarely slightly sinuate, green above, glaucescent beneath, glabrous, or when young sparsely and minutely puberulent; racemes slender, 5–16 cm. long, the flowers remote, on pedicels 1 mm. long; bracts lanceolate or linear, 4–7 mm. long, glabrous; perianth 7–9 mm. long, 9 mm. broad, glabrous; stamens long-exserted; fruit 10–12 mm. long, slender-stipitate, 2–2.5 mm. thick; seed obovoid, about 4 mm. long, rounded at the apex, acuminate at the base, brown.

TYPE LOCALITY: Plains near Tehuacán, Puebla.

DISTRIBUTION: Dry, rocky slopes, western Texas and southern New Mexico, southward to Nuevo León and Puebla.

**2. Cyphomeris crassifolia** Standley, Contr. U. S. Nat. Herb. 13: 428. 1911.

*Senkenbergia crassifolia* Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

Plants 6–10 dm. high, suffruticose below, much branched, the branches slender, pale-green, finely and sparsely puberulent, the branches of the inflorescence glabrous; petioles 0.4–2.5 cm. long; leaf-blades rhombic, broadly oblong, or rhombic-ovate, 1.5–3 cm. long, 1–2



cm. wide truncate to rounded or broadly cuneate at the base, obtuse or acutish at the apex, coarsely sinuate-lobate, green above, paler beneath, densely and finely puberulent; racemes 5–10 cm. long, the flowers on pedicels 1 mm. long; bracts lance-linear, 4–5 mm. long, green, glabrous; perianth 6–7 mm. long, glabrous, the tube very short, the limb 7 mm. broad; stamens long-exserted; fruit 7 mm. long, short-stipitate, 2 mm. thick in the widest part.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Nuevo León and Coahuila.

**18. COMMICARPUS** Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

Perennial herbs or shrubs, pubescent or glabrous, usually decumbent or reclining, the stems much branched. Leaves opposite, those of a pair subequal, petiolate, the blades broad, more or less succulent, entire or sinuate. Flowers perfect, umbellate or verticillate, pedicellate, each pedicel bracteate, the bracts forming an involucre; perianth funnelform or campanulate, corolla-like, white or green, usually with a distinct tube, constricted above the ovary, the limb shallowly 5-lobed, induplicate-plicate. Stamens 2–5; filaments exserted, capillary, unequal, connate at the base; anthers didymous. Ovary stipitate, attenuate to a filiform style; stigma peltate. Anthocarp cylindric-fusiform, symmetric, finely costate vertically, pubescent or glabrous, bearing numerous verrucose glands. Seed with a thin testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the scanty endosperm; radicle slender, elongate, descending.

Type species, *Boerhaavia scandens* L.

Perianth 3 mm. long and broad, glabrous or obscurely puberulent; glands of the fruit irregularly scattered.

1. *C. scandens*.

Perianth 7–8 mm. long, 10 mm. broad, short-villous or hirtellous; glands of the fruit grouped in transverse bands.

2. *C. Brandegei*.

**1. Commicarpus scandens** (L.) Standley, Contr. U. S. Nat. Herb. 12: 373. 1909.

*Boerhaavia scandens* L. Sp. Pl. 3. 1753.

*Boerhaavia Grahami* A. Gray, Am. Jour. Sci. II. 15: 323. 1853.

Plants decumbent or usually clambering over shrubs, fruticose or suffrutescent below, much branched, the branches slender, pale-green, glabrous, or obscurely puberulent about the nodes; petioles slender, 1–2 cm. long; leaf-blades broadly cordate-ovate to ovate-deltoid or rarely rhombic-orbicular, 1.5–6.5 cm. long, 1–4.5 cm. wide, deeply cordate to truncate at the base and unequal, attenuate to acute or rarely rounded at the apex, rather succulent, bright-green, slightly paler beneath, glabrous, or when young obscurely puberulent or scaberrulous; flowers umbellate, the peduncles slender, 2–4.5 cm. long, the pedicels slender, 5–10 mm. long, glabrous; bracts lanceolate or oblong, 2–3 mm. long, green, ciliolate, caducous; perianth greenish-yellow, 3–4 mm. long and broad, glabrous or rarely obscurely puberulent; stamens 2 or rarely 3, exserted; fruit about 1 cm. long and 2 mm. in diameter, narrowly clavate-cylindric, glabrous, bearing few or numerous glands irregularly scattered along the costae.

TYPE LOCALITY: Santiago de la Vega [Spanish Town], Jamaica.

DISTRIBUTION: Western Texas to southeastern Arizona and Lower California, and southward nearly throughout Mexico; nearly throughout the West Indies; also from Colombia and Venezuela to Peru.

ILLUSTRATIONS: Jacq. Hort. Vindob. 1: pl. 4; Lam. Tab. Encyc. pl. 4; Meerb. Pl. Rar. pl. 21; Gaertn. Fruct. pl. 127.

**2. Commicarpus Brandegei** Standley, Contr. U. S. Nat. Herb. 12: 374. 1909.

*Boerhaavia elongata* Brand. Proc. Calif. Acad. II. 2: 199. 1889. Not *B. elongata* Salisb. 1796.

*Commicarpus Brandegei glabrior* Standley, Contr. U. S. Nat. Herb. 12: 374. 1900.

Plants much branched, 2 meters long or more, prostrate or clambering over shrubs, the branches slender, glaucescent, often sparsely short-villous when young but soon glabrate; petioles slender, 5–15 mm. long; leaf-blades broadly cordate-ovate or ovate-deltoid, 2–5 cm.



long, 1.5–3 cm. wide, cordate at the base and slightly unequal, acute or attenuate at the apex, minutely puberulent when young but soon glabrate; flowers in 3–6-flowered umbels on long slender peduncles, the pedicels 1–2 cm. long, short-villous or rarely glabrate; bracts linear, 2–3 mm. long, green, short-villous, caducous; perianth 7–10 mm. long, 10–15 mm. broad, white, short-villous outside, at least below; stamens 2, exserted; fruit narrowly clavate-oblong, 5–10 mm. long, 2 mm. thick, dark-green, glabrous, bearing numerous glands arranged in 3 or 4 transverse bands.

TYPE LOCALITY: San Pablo, Lower California.

DISTRIBUTION: Southern Lower California.

19. *ANULOCAULIS* Standley, Contr. U. S. Nat. Herb. 12: 374.  
1909.

Tall erect perennial herbs, more or less pubescent, branched, the internodes usually each with a viscid ring. Leaves opposite, petiolate, few, borne near the base of the stem, the blades broad, coriaceous, glandular-dentate or denticulate. Flowers perfect, bracteate, umbellate or in axillary glomerules or racemose, the inflorescence ample, much branched, the bracts small, scarious or coriaceous; perianth funnelform, the tube elongate, constricted above the ovary, the limb campanulate or subrotate, 5-lobed, induplicate-plicate. Stamens 3 or 5, exserted; filaments unequal, filiform, connate at the base; anthers didymous. Style filiform, the stigma peltate. Anthocarp coriaceous, biturbinate, 10-striate, glabrous, in one species (probably in all) developing at maturity a broad median horizontal wing. Seed with its thin testa adherent to the pericarp; embryo uncinat, the broad cotyledons enclosing the copious endosperm; radicle elongate, descending.

Type species, *Boerhaavia eriosolena* A. Gray.

Perianth glabrous, 2.5–3 cm. long; leaf-blades glabrous or nearly so.

1. *A. leiosolenus*.

Perianth villous, 8–10 mm. long; leaf-blades long-villous beneath, at least when young.

Flowers mostly in sessile axillary clusters; perianth abruptly expanded into a subrotate limb.

2. *A. eriosolenus*.

Flowers in pedunculate terminal umbels; perianth gradually dilated into a campanulate limb.

3. *A. annulatus*.

1. *Anulocaulis leiosolenus* (Torr.) Standley, Contr. U. S. Nat. Herb.  
12: 375. 1909.

*Boerhaavia leiosolena* Torr. Bot. Mex. Bound. Surv. 172. 1859.

*Acleisanthes nummularia* M. E. Jones, Contr. West. Bot. 10: 43. 1902.

*Boerhaavia nummularia* M. E. Jones; Prain, Ind. Kew. Suppl. 4: 27. 1913.

Plants erect, 6–10 dm. high, sparsely branched below, the branches stout, glaucous, glabrous; leaves 1 or 2 pairs at the base of the stem, the petioles stout, 2–11 cm. long, the blades reniform to broadly oval, rhombic-orbicular, or ovate-oval, 3.5–15 cm. long, 3.5–12.5 cm. wide, deeply cordate to truncate at the base, broadly rounded at the apex, rather coarsely sinuate, thick-coriaceous, yellowish-green on the upper surface and when young tomentulose, beneath glaucescent and tomentulose or villous when young but early glabrate and gland-dotted; inflorescence much branched, the branches stout, naked, the flowers fasciculate or in dense spikes, short-pedicellate; bracts minute, ovate, coriaceous, glabrous; perianth yellowish-green, 2.5–3 cm. long, glabrous, gradually dilated above into a narrow limb; stamens 5, short-exserted, fruit biturbinate, 5–6 mm. long, glaucous, in age developing at the middle a rigid horizontal wing 6–7 mm. in diameter; seed biturbinate, 3 mm. long, pale-brown.

TYPE LOCALITY: In gypseous soil, Great Canyon of the Rio Grande, 70 miles below El Paso, Texas.

DISTRIBUTION: In strongly alkaline soil, western Texas to Arizona and Nevada.

2. *Anulocaulis eriosolenus* (A. Gray) Standley, Contr. U. S. Nat.  
Herb. 12: 375. 1909.

*Boerhaavia eriosolena* A. Gray, Am. Jour. Sci. II. 15: 322. 1853.

Plants erect, 2–10 dm. high, sparsely branched below, the branches very stout, glabrous; petioles stout, 1–4 cm. long; leaf-blades orbicular-oval to ovate-oval, 2.2–10 cm. long, 2–7 cm.



wide, cordate or subcordate at the base, rounded at the apex, coriaceous, glandular-denticulate, sparsely scabrous on the upper surface with stout conic hairs having dark glandular bases, similarly pubescent beneath with longer hairs, glabrate in age; inflorescence paniculately much branched, the branches slender, naked, the flowers in axillary and terminal few-flowered clusters, on slender pedicels 2–4 mm. long; bracts ovate-oblong or lance-oblong, 2–3 mm. long, acuminate, scarious, glabrous, usually ciliolate; perianth 1 cm. long, the tube slender, long-villous, very abruptly expanded into a nearly rotate limb 1 cm. broad; stamens 5, short-exserted; fruit turbinate, 5 mm. long, conic above, glabrous.

TYPE LOCALITY: Valley near Azufrora, Coahuila.

DISTRIBUTION: Western Texas and Coahuila.

### 3. *Anulocaulis annulatus* (Coville) Standley, Contr. U. S. Nat.

Herb. 12: 375. 1909.

*Boerhaavia annulata* Coville, Contr. U. S. Nat. Herb. 4: 177. 1893.

Plants erect from a decumbent base, 5–10 dm. high, sparsely branched below, loosely paniculate above, the branches stout, glaucescent, at least below, glabrous except at the villous nodes; petioles stout, 2–4 cm. long; leaf-blades broadly oval to ovate-oval or ovate-deltoid, 3–8 cm. long, 2–6 cm. wide, subcordate or rounded at the base and subequal, rounded at the apex or rarely only obtuse, coriaceous, shallowly and irregularly repand-dentate, yellowish-green above and hirsute with slender hairs having dark enlarged glandular bases, paler beneath and densely hirsute with similar hairs; inflorescence nearly naked, the branches slender, the flowers in dense many-flowered headlike long-pedunculate umbels; bracts short, lanceolate, hirsute, the hairs with glandular bases; perianth 8 mm. long, greenish, the tube stout, long-villous, gradually dilated into a campanulate limb; stamens 3, short-exserted; fruit biturbinate, 5 mm. long, glabrous.

TYPE LOCALITY: Furnace Creek Canyon, Funeral Mountains, Inyo County, California.

DISTRIBUTION: Inyo County, California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 4: *pl. 18*.

## 20. *ALLIONIA* L. Syst. Nat. ed. 10. 890. 1759.

*Vitmania* Turra; Cav. Ic. 3: 53. 1794. Not *Vitmannia* Vahl, 1794.

*Oxybaphus* L'Hér.; Willd. Sp. Pl. 1: 185. 1797.

*Calyxhymenia* Ortega, Dec. 5. 1797.

*Calymenia* Pers. Syn. Pl. 1: 36. 1805.

Perennial plants, herbaceous or rarely suffruticose, erect or procumbent, viscid-pubescent or glabrous, usually branched, the branches somewhat swollen at the nodes. Leaves opposite, sessile or petiolate, the blades entire or undulate, often asymmetric. Flowers perfect, involucre, the involucre 1–3-flowered, equally or unequally 5-lobed, in fruit more or less accrescent, often nearly rotate in age and reticulate-veined; perianth campanulate or broadly short-funnelform, usually oblique, the tube usually very short, constricted above the ovary, the limb 5-lobed, the lobes induplicate-valvate, emarginate, the perianth deciduous after anthesis. Stamens 3–5; filaments capillary, unequal, circinnate, short-connate at the base, usually exserted; anthers didymous. Ovary ovoid or subglobose; style filiform; stigma long-papillose. Anthocarp obovoid, usually 5-angulate or 5-sulcate, almost terete, rugose or tuberculate, or the angles smooth, constricted at the base, glabrous or pubescent, mucilaginous when wet. Seed adherent to the pericarp; embryo uncinat, the cotyledons enclosing the copious endosperm; radicle exterior, elongate, descending.

Type species, *Allionia violacea* L.

Fruit glabrous.

Angles of the fruit covered with coarse, distinct tubercles.

Stems densely viscid-pilose below.

Stems glabrous up to the inflorescence.

Involucres in fruit 6–10 mm. long; blades of the lower leaves usually broadly cordate-deltoid, twice as long as broad or shorter.

Involucres in fruit 4–6 mm. long; blades of the lower leaves elongate deltoid-lanceolate, three times as long as broad or longer.

1. *A. viscosa*.

2. *A. corymbosa*.

3. *A. microchlamydea*.



Angles of the fruit continuous, smooth.

Leaf-blades linear, 2–7 mm. wide; stems glabrous.

Leaf-blades lanceolate or broader, 10–40 mm. wide.

Stems glabrous.

Stems densely short-pilose.

Fruit more or less pubescent, sometimes with only sparse pubescence of short hairs.

Leaf-blades sessile or nearly so, or sometimes gradually attenuate to a short, stout petiole, the blade not sharply differentiated from the petiole.

Leaf-blades linear or lance-linear.

Perianth deep bright-red, about 4 times as long as the involucre, much longer than broad.

Perianth pink or purplish-red, about twice as long as the involucre, usually broader than long.

Stems densely hirsute or long-villous, at least at the base, glaucous.

Stems glabrous below or nearly so.

Stems glaucous; leaf-blades sessile or gradually narrowed to a short, stout or marginate petiole, glaucous or glaucescent beneath.

Stems green; leaf-blades, at least the lower ones, subabruptly contracted into a slender petiole, bright-green.

Leaf-blades lanceolate or broader.

Stems densely hirsute, at least near the base, the middle nodes sometimes glabrate but the nodes always hirsute.

Stems puberulent or glabrate, or sometimes pilose or hirsute above but not near the base.

Stems densely puberulent throughout; leaf-blades ovate to ovate-deltoid.

Stems glabrate below or puberulent only in lines; leaf-blades mostly lanceolate.

Angles of the fruit strongly tuberculate or composed of distinct tubercles.

Angles of the fruit continuous, smooth or nearly so.

Leaf-blades usually broadly rounded at the base or even subcordate, those of the lower leaves sometimes acute at the base; branches of the inflorescence mostly opposite.

Leaf-blades acute or acuminate at the base; branches of the inflorescence mostly alternate.

Leaf-blades, at least most of them, on long slender petioles, the blades usually obtuse to cordate at the base and sharply differentiated from the petioles.

Fruit prominently 5-angulate, the angles smooth or tuberculate; stems usually stout, erect or decumbent, and sparsely branched; involucre much accrescent in fruit, the lobes equal or nearly so.

Involucres at anthesis usually glabrous except at the base, there short-pilose or puberulent, the lobes glabrous, in fruit usually 15–20 mm. broad.

Involucres at anthesis densely viscid-pilose outside, in fruit usually less than 15 mm. broad.

Stems densely puberulent, pilose, or hirsute below, over the whole surface, with stiff hairs.

Leaf-blades usually twice as long as broad, ovate or ovate-oblong, and obtuse at the base; plants tall, erect, simple or sparsely branched below.

Leaf-blades less than twice as long as broad, mostly ovate-deltoid or deltoid, usually truncate or subcordate at the base; plants low, spreading, much branched below, the branches mostly divergent.

Stems puberulent or short-pilose below with weak, soft hairs.

Stems hirsute below with long, stiff hairs.

Stems glabrous below or puberulent in lines, very rarely pilose with weak, soft, viscid hairs.

Plants suffruticose.

Plants herbaceous.

Blades of the upper leaves about as broad as long, rounded or very obtuse at the apex; involucre in fruit 10–12 mm. long.

Blades of the upper leaves usually twice as long as broad or longer, lance-oblong to linear, commonly long-acuminate to attenuate at the apex; involucre in fruit rarely over 8 mm. long.

Lobes of the involucre oval-oblong, longer than the tube, all or most of them rounded at the apex, usually pilose with black hairs.

4. *A. glabra*.

5. *A. exaltata*.

6. *A. Carletoni*.

7. *A. coccinea*.

8. *A. gausapoides*.

9. *A. linearis*.

10. *A. decipiens*.

11. *A. hirsuta*.

12. *A. pauciflora*.

13. *A. albida*.

14. *A. lanceolata*.

15. *A. aggregata*.

19. *A. nyctaginea*.

16. *A. coahuilensis*.

17. *A. pumila*.

18. *A. rotundifolia*.

21. *A. suffruticosa*.

20. *A. Grayana*.



- Leaf-blades linear or lance-linear, acute or attenuate at the base. 10. *A. decipiens*.  
 Leaf-blades mostly elongate-deltoid or deltoid, sometimes rather broadly lanceolate, obtuse to cordate at the base. 22. *A. comata*.  
 Lobes of the involucre broadly ovate or ovate-orbicular, usually shorter than the tube, acute or acutish at the apex, at least in fruit, pilose with white or fulvous hairs.  
 Leaf-blades acute or acutish at the base, lanceolate or broadly lanceolate. 15. *A. aggregata*.  
 Leaf-blades rounded to cordate at the base, ovate-cordate to lance-deltoid.  
 Leaf-blades deeply cordate at the base, often shorter than the petioles, these puberulent or short-pilose with fulvous hairs; fruit 5 mm. long. 23. *A. longipes*.  
 Leaf-blades rounded to subcordate at the base, much longer than the petioles, these long-pilose with white hairs; fruit 3.5–4 mm. long. 24. *A. ciliata*.  
 Fruit terete at maturity, irregularly and sparsely tuberculate; stems slender, usually procumbent, much branched; involucre only slightly accrescent in fruit, the lobes very unequal. 25. *A. violacea*.

### 1. *Allionia viscosa* (Cav.) Kuntze, Rev. Gen. 533. 1891.

*Mirabilis viscosa* Cav. Ic. 1: 13. 1791.  
*Nyctago parviflora* Salisb. Prodr. 57. 1796.  
*Calyxhymenia viscosa* R. & P. Fl. Per. 1: 46. 1798.  
*Calymenia viscosa* Pers. Syn. Pl. 1: 36. 1805.  
*Vitmania viscosa* Turra; Steud. Nom. 140, as synonym. 1821.  
*Oxybaphus viscosus* L'Hér.; Choisy, in DC. Prodr. 13<sup>2</sup>: 430. 1849.  
*Oxybaphus Cervantesii* S. Wats. Proc. Am. Acad. 21: 436. 1886. Not *O. Cervantesii* Sweet, 1825.  
*Allionia rotata* Standley, Contr. U. S. Nat. Herb. 12: 347. 1909.  
*Oxybaphus rotatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect, 4–15 dm. high, stout, sparsely branched or simple below the inflorescence, green, densely short-pilose with viscid hairs; petioles slender, 1–6.5 cm. long, densely short-pilose; leaf-blades broadly cordate-ovate to ovate-deltoid, 2.5–10 cm. long, 1.5–9 cm. wide, usually cordate at the base but sometimes truncate, abruptly short-decurrent, acute or attenuate at the apex, entire or subsinuate, thin, bright-green, sparsely viscid-puberulent or glabrate on the upper surface, short-pilose or puberulent beneath, the leaves of the inflorescence reduced and bractlike, often very numerous, sessile or short-petiolate, the blades ovate to suborbicular; inflorescence ample, paniculate, much branched, the branches opposite, ascending, stout or slender, densely viscid-pilose with short fulvous hairs; involucre numerous, slender-pedunculate, at anthesis 3–5 mm. long, in fruit 15–25 mm. broad, densely viscid-pilose, the lobes broadly rounded; flowers solitary or rarely 2 or 3 in each involucre, the perianth 8–20 mm. long, purplish-red, sparsely pilose outside, the limb 15–25 mm. broad; stamens 3, long-exserted; fruit obovoid, 5 mm. long, brownish-gray, glabrous, densely covered with large coarse rounded tubercles; seed oval-obovoid, 3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Huanuco, Peru.

DISTRIBUTION: Chihuahua to Tamaulipas and Oaxaca; Peru.

ILLUSTRATIONS: Cav. Ic. 1: pl. 19; Schnizl. Ic. pl. 104; Bot. Mag. pl. 434; Dict. Sci. Nat. pl. 22.

### 2. *Allionia corymbosa* (Cav.) Kuntze, Rev. Gen. 533. 1891.

*Mirabilis corymbosa* Cav. Ic. 4: 55. 1797.  
*Calyxhymenia glabrifolia* Ortega, Dec. 5. 1797.  
*Calymenia corymbosa* Pers. Syn. Pl. 1: 37. 1805.  
*Oxybaphus glabrifolius* Vahl, Enum. Pl. 2: 40. 1806.  
*Allionia corymbosa texensis* Coult. Contr. U. S. Nat. Herb. 2: 351. 1894.  
*Allionia texensis* Small, Fl. SE. U. S. 406. 1903.  
*Oxybaphus texensis* Weatherby, Proc. Am. Acad. 45: 425. 1910.  
*Allionia cardiophylla* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.  
*Oxybaphus cardiophyllus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect or ascending, 3–10 dm. high, stout, simple or sparsely branched below, rarely suffrutescent, glaucous or glaucescent, glabrous or bifariously puberulent, usually puberulent or short-pilose at the nodes, the internodes elongate; petioles slender, 0.5–6 cm.



long, glabrous; leaf-blades broadly cordate-ovate to elongate ovate-deltoid, 2–8 cm. long, 1–5.5 cm. wide, deeply cordate to truncate at the base and usually short-decurrent, obtuse or acute at the apex, entire or subsinuate, thick and succulent, green on the upper surface, often glaucous beneath, glabrous or obscurely puberulent; inflorescence cymose-paniculate, usually much branched, the branches slender, viscid-pilose with short fulvous hairs, the bracts few and very small, the involucre usually numerous, slender-pedunculate, viscid-pilose, about 4 mm. long at anthesis, 6–10 mm. long in fruit, the lobes short, rounded-oval; flowers usually solitary in the involucre, rarely 2 or 3, the perianth sparsely pilose, 6–10 mm. long, the limb 10–12 mm. broad; stamens 3, exserted; fruit broadly obovoid, 3.5 mm. long, dark-grayish, glabrous, densely covered with short rounded tubercles; seed oval-obovoid, 2.5 mm. long, pale-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southwestern Texas and Coahuila to Hidalgo and Oaxaca.

ILLUSTRATIONS: Cav. Ic. *pl.* 379; Ortega, Dec. *pl.* 1.

### 3. *Allionia microchlamydea* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

Stems mostly solitary, erect, 4–8 dm. high, simple or sparsely branched below the inflorescence, slender, glaucous below and glabrous, the internodes elongate; petioles slender, 0.5–3.5 cm. long, glabrous; leaf-blades narrowly deltoid-lanceolate or lance-deltoid, 3–7 cm. long, 0.6–1.5 cm. wide, obtuse or truncate at the base and abruptly short-decurrent, gradually narrowed to the obtuse apex, entire or sinuate-dentate, thick and succulent, green on the upper surface, glaucous or glaucescent beneath, glabrous; inflorescence cymose-paniculate, much branched, the branches slender, alternate, sparsely or densely viscid-pilose, the bracts minute, the involucre numerous, slender-pedunculate, about 2.5 mm. long at anthesis, 4–6 mm. long in fruit, viscid-pilose, the lobes rounded-oval; flowers solitary in the perianth; fruit broadly obovoid, 2.5–3 mm. long, dark-gray, glabrous, densely covered with coarse rounded tubercles; seed oval-obovoid, 2 mm. long, pale yellowish-brown.

TYPE LOCALITY: In rocky soil near Ixmiquilpán, Hidalgo.

DISTRIBUTION: Stony hillsides, Querétaro and Hidalgo.

### 4. *Allionia glabra* (S. Wats.) Kuntze, Rev. Gen. 533. 1891.

*Oxybaphus glaber* S. Wats. Am. Nat. 7: 301. 1873.

*Oxybaphus glaber recedens* Weatherby, Proc. Am. Acad. 45: 425. 1910.

*Allionia glabra recedens* Standley, Contr. U. S. Nat. Herb. 13: 406. 1911.

Stems few or solitary, erect, 8–15 dm. high, usually simple up to the inflorescence or with a few sterile branches below, stout, glaucous or glaucescent, glabrous; leaves distant, or crowded below, sessile, the blades linear, 5–12 cm. long, 2–7 mm. wide, long-attenuate to the base, gradually narrowed to the obtuse or acute apex, entire, thick and succulent, glaucous beneath, glabrous; inflorescence a loose terminal panicle 1–4 dm. long, much branched, the branches very slender, opposite, glabrous or sparsely short-pilose with viscid hairs; involucre slender-pedunculate, at anthesis about 3.5 mm. long, in age 12–15 mm. broad, viscid-pilose or glabrous and ciliate, shallowly lobed, the lobes ovate-orbicular, rounded at the apex; flowers usually solitary, sometimes 2, in the involucre, mostly cleistogamous, the perianth about 7 mm. long, white or pale-pink, glabrous; stamens 5, short-exserted; anthocarp obovoid, about 5 mm. long, olivaceous, glabrous, the angles acute, narrow, smooth, the sides obtusely short-tuberculate or rugose; seed broadly obovoid, 3 mm. long, pale-brown.

TYPE LOCALITY: Kanab, Utah.

DISTRIBUTION: In dry soil, southeastern Utah to Chihuahua, western Texas, and Kansas.

### 5. *Allionia exaltata* Standley, Contr. U. S. Nat. Herb. 12: 355. 1909.

*Oxybaphus exaltatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary from a stout woody root, erect, about 15 dm. high, stout, glabrous, glaucescent below, simple or sparsely branched below the inflorescence, the internodes elongate;



petioles stout, 3–10 mm. long, glabrous; leaf-blades elliptic-lanceolate or lanceolate, 4.5–7 cm. long, 0.7–2 cm. wide, acute at the base and apex, entire or subsinuate, thick and succulent, often glaucous or glaucescent beneath, glabrous; inflorescence a large open panicle, much branched, the branches slender, ascending, glabrous or very sparsely short-pilose with viscid hairs, the peduncles slender, elongate, short-pilose or glabrous, the involucre 3–4 mm. long at anthesis, 10–12 mm. long in fruit, sparsely short-pilose or glabrous, the lobes short, rounded; flowers usually 3 in each involucre; fruit obovoid, 4.5 mm. long, brownish, glabrous, the angles acute, narrow, smooth, the sides transverse-rugulose; seed obovoid, pale yellowish-brown.

TYPE LOCALITY: Cimarron Valley, Cherokee Outlet, Oklahoma.  
DISTRIBUTION: Oklahoma.

6. *Allionia Carletoni* Standley, Contr. U. S. Nat. Herb. 12: 355.  
1909.

*Oxybaphus hirsutus* Holz. Contr. U. S. Nat. Herb. 1: 213. 1892. Not *O. hirsutus* Sweet, 1825.  
*Oxybaphus nyctagineus pilosus* Holz. Contr. U. S. Nat. Herb. 1: 213. 1892. Not *O. nyctagineus pilosus* A. Gray, 1859.  
*Oxybaphus Carletoni* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, erect, 6–12 dm. high, stout, glaucous below, simple or sparsely branched below the inflorescence, densely viscid-pilose with short slender fulvous hairs; leaves sessile or subsessile, the very stout broad petioles 4 mm. long or shorter, the blades broadly deltoid-ovate to ovate or ovate-oblong, 4–8 cm. long and 1–4 cm. wide, or larger, subcordate to obtuse at the base, narrowed to the obtuse or acute apex, entire or subsinuate, thick and succulent, green, or often glaucous beneath, densely short-pilose with viscid hairs, or sometimes glabrate in age; inflorescence ample, paniculate, the branches stout, opposite, densely viscid-pilose, the bracts very small, the peduncles slender, elongate, the involucre 5–6 mm. long at anthesis, in age 12–18 mm. broad, densely viscid-pilose, the lobes broadly rounded; flowers usually 3 in each involucre, the perianth sparsely pilose, pink; stamens usually 3, exserted; fruit obovoid, 5 mm. long, brown, glabrous, the angles acute, narrow, smooth, the sides rugulose or obscurely tuberculate, conspicuously raphidulous; seed broadly obovoid, 3–3.5 mm. long, pale-brown.

TYPE LOCALITY: Barber County, Kansas.  
DISTRIBUTION: Oklahoma and southern Kansas.  
ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 1730.

7. *Allionia coccinea* (Torr.) Standley, Contr. U. S. Nat. Herb.  
12: 339. 1909.

*Oxybaphus coccineus* Torr. Bot. Mex. Bound. Surv. 169. 1859.  
*Mirabilis coccinea* Benth. & Hook. Gen. Pl. 3: 3. 1880.  
*Oxybaphus linearifolius* S. Wats. Proc. Am. Acad. 17: 375. 1882.  
*Allionia linearifolia* Kuntze, Rev. Gen. 533. 1891.  
*Mirabilis coccinea scabridata* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.  
*Allionia linearis coccinea* M. E. Jones, Contr. West. Bot. 10: 51. 1902.  
*Allionia gracillima* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.  
*Allionia gracillima filifolia* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.  
*Allionia gracillima scabridata* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.  
*Allionia linearifolia filifolia* Standley, Contr. U. S. Nat. Herb. 16: 120. 1913.

Stems solitary or numerous from an elongate woody root, erect or ascending, sparsely or copiously branched, the branches very slender, glaucous, glabrous, ascending, the internodes short or elongate; leaves numerous or few, sessile, the blades filiform or linear, 2–12 cm. long, 1–4 mm. wide, long-attenuate to each end, thick and succulent, glaucous or glaucescent, at least beneath, glabrous; involucre slender-pedunculate, axillary and solitary in young plants and mostly with cleistogamous flowers, in mature plants arranged in loose paniculate cymes, these with slender, opposite, sparsely short-pilose branches; involucre at anthesis 4–5 mm. long, short-pilose or puberulent, deeply lobed, the lobes oval-ovate, acute or acutish, slightly accrescent in age; flowers 1–3 in each involucre, the perianth 15–20 mm. long, deep purplish-red, the tube 3–4 mm. in diameter, gradually widening upward, the limb 11–15 mm. broad, deeply 5-lobed, the lobes retuse; stamens 5, exserted; anthocarp obovoid, 5 mm. long, oli-



vaceous, finely hirtellous, 5-lobed, the angles broad, smooth or tuberculate, the sulci coarsely transverse-rugose; seed broadly obovoid, 2.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: Hillsides, Copper Mines [Santa Rita], New Mexico.

DISTRIBUTION: Dry hillsides, southwestern New Mexico, southeastern Arizona, and northern Sonora.

8. *Allionia gausapoides* Standley, Contr. U. S. Nat. Herb. 13: 406. 1911.

*Mirabilis linearis subhispida* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.

*Allionia linearis subhispida* Standley, Contr. U. S. Nat. Herb. 12: 342. 1909.

*Allionia subhispida* Standley, Contr. U. S. Nat. Herb. 16: 120. 1913.

Stems solitary or few, erect or decumbent, stout, 3–8 dm. high, sparsely branched, glaucous or glaucescent, densely hirsute at the base, viscid-puberulent or short-pilose above; leaves distant or crowded, sessile, the blades linear or lance-linear, 3–10 cm. long, 1.5–5 mm. wide, attenuate to each end, entire, thick and succulent, glaucous or glaucescent beneath, densely short-pilose or hirsute or sometimes glabrate; inflorescence terminal, cymose-paniculate, sparsely branched, the branches slender, alternate, viscid-puberulent or densely villous; involucre few, slender-pedunculate, solitary or clustered, at anthesis 3.5–5 mm. long, in age about 15 mm. broad, densely viscid-villous with fulvous hairs, the lobes broadly rounded; flowers usually 3 in each involucre, the perianth about 1 cm. long, pink, sparsely short-pilose; stamens 5, exserted; anthocarp obovoid, 4.5–5 mm. long, short-hirtellous, olivaceous, the angles broad, smooth, the sides coarsely transverse-rugose.

TYPE LOCALITY: Region of San Luis Potosí, San Luis Potosí.

DISTRIBUTION: In dry soil, New Mexico and western Texas to San Luis Potosí.

9. *Allionia linearis* Pursh, Fl. Am. Sept. 728. 1814.

*Calymenia angustifolia* Nutt. Gen. 1: 26. 1818.

*Calymenia decumbens* Nutt. Gen. 1: 26. 1818.

*Allionia decumbens* Spreng. Syst. 1: 384. 1825.

*Oxybaphus angustifolius* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus decumbens* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus angustifolius linearis* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus angustifolius decumbens* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Mirabilis angustifolia* MacM. Metasp. Minn. Valley 216. 1892.

*Oxybaphus Bodini* Holz. Contr. U. S. Nat. Herb. 1: 287. 1893.

*Allionia Bodini* Morong, Mem. Torrey Club 5: 354. 1894.

*Allionia Bushii* Britton, Bull. Torrey Club 22: 223. 1895.

*Oxybaphus angustifolius viscidus* Eastw. Proc. Calif. Acad. II. 6: 313. 1896.

*Mirabilis nyctaginea angustifolia* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Allionia diffusa* Heller, Minn. Bot. Stud. 2: 33. 1898.

*Mirabilis linearis* Heimerl, Ann. Cons. Jard. Genève 5: 186. 1901.

*Allionia glandulifera* A. Nelson, Bot. Gaz. 34: 364. 1902.

*Allionia divaricata* Rydb. Bull. Torrey Club 29: 691. 1902.

*Allionia viscida* Cockerell, Proc. Acad. Phila. 1904: 108. 1904.

*Allionia montanensis* Osterhout, Muhlenbergia 1: 39. 1906.

*Mirabilis decumbens* Daniels, Univ. Missouri Stud. Sci. 1: 276. 1907.

*Oxybaphus linearis* B. L. Robinson, Rhodora 10: 31. 1908.

*Allionia petrophila* Standley, Contr. U. S. Nat. Herb. 12: 340. 1909.

*Allionia Vaseyi* Standley, Contr. U. S. Nat. Herb. 12: 343. 1909.

*Allionia pinetorum* Standley, Contr. U. S. Nat. Herb. 12: 344. 1909.

*Allionia pilosa decumbens* A. Nelson; Coult. & Nels. Man. 173. 1909.

*Allionia linearis Bodini* A. Nelson; Coult. & Nels. Man. 174. 1909.

Plants erect or decumbent, 1–12 dm. high, the stems solitary or several, simple or branched below, the branches ascending, slender or stout, glaucous, often nearly white, glabrous below or bifariously puberulent, viscid-puberulent or short-villous above, the internodes short or elongate; leaves numerous or few, sometimes crowded, the blades narrowly linear to lance-linear, 3–10 cm. long, 1–5 or rarely 12 mm. wide, attenuate and sessile at the base or gradually narrowed to a short stout marginate petiole, narrowed to the obtuse or acute apex, entire, thick and succulent, usually glaucous, at least beneath, often ciliate, glabrous, or those of the uppermost leaves viscid-puberulent; involucre slender-pedunculate, usually all axillary in young plants and with cleistogamous flowers, the plants in age developing a loosely branched cymose panicle, the branches slender, opposite or alternate, viscid-puberulent or short-villous with mostly fulvous hairs, bearing few or numerous reduced bractlike leaves, these sessile,



linear to broadly ovate; involucre at anthesis about 4 mm. long, densely viscid-villous with fulvous hairs, the lobes ovate-orbicular or oval, rounded or acutish at the apex, the involucre in age 12–20 mm. broad, the lobes rounded, conspicuously veined; flowers usually 3 in each involucre, the perianth about 10 mm. long, sparsely pilose, pale-pink to purplish-red, the limb deeply lobed, the lobes retuse; anthocarp 4.5–5 mm. long, obovoid, brownish or olivaceous, the angles smooth, the sides coarsely transverse-rugose; seed rounded-obovoid, 3 mm. long, pale yellowish-brown.

TYPE LOCALITY: "Upper Louisiana."

DISTRIBUTION: Usually in dry soil, South Dakota to Montana, Arizona, San Luis Potosí, Texas, and western Missouri, rarely adventive eastward.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1419, 1421; ed. 2, f. 1726; Contr. U. S. Nat. Herb. 1: pl. 21; Clements, Rocky Mt. Fl. pl. 8, f. 1.

#### 10. *Allionia decipiens* Standley, sp. nov.

*Allionia divaricata* Standley, Contr. U. S. Nat. Herb. 12: 342, in part. 1909. Not *A. divaricata* Rydb. 1902.

Stems solitary or few, erect or decumbent, 3–8 dm. high, slender, simple or sparsely branched below the inflorescence, green, bifariously puberulent or glabrate, the internodes elongate, usually longer than the leaves; petioles slender, 0.2–3.5 cm. long, or the uppermost leaves sessile, the blades lanceolate to linear, 2.5–12 cm. long, 2.5–10 or rarely 20 mm. wide, obtuse to attenuate at the base, narrowed to the obtuse or acute apex, entire, bright-green, usually ciliate but otherwise glabrous; inflorescence loosely cymose-paniculate, the branches slender, alternate, viscid-villous with short fulvous hairs; involucre usually crowded, on short slender peduncles, 4–5 mm. long at anthesis, 10–12 mm. broad in fruit, densely viscid-villous, the lobes ovate-oval, rounded or obtuse at the apex; flowers 3 in each involucre, the perianth 8–10 mm. long, deep purplish-red, sparsely short-pilose, the limb 5-lobed, the lobes retuse; fruit obovoid, 4.5 mm. long, olivaceous, minutely hirtellous, the angles smooth, the sides transverse-rugose; seed oval-obovoid, 2.5 mm. long, pale yellowish-brown.

Type collected in an oak thicket, Brazos Canyon, Rio Arriba County, New Mexico, August 24, 1914, P. C. Standley & H. C. Bollman 10743 (U. S. Nat. Herb. no. 689453).

DISTRIBUTION: Mountain slopes, Arizona, New Mexico, and southern Colorado.

#### 11. *Allionia hirsuta* Pursh, Fl. Am. Sept. 728. 1814.

*Calymenia pilosa* Nutt. Gen. 1: 26. 1818.

*Calymenia hirsuta* Nutt. Gen. 1: 26. 1818.

*Oxybaphus pilosus* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus hirsutus* Sweet, Hort. Brit. 1: 334. 1826.

*Oxybaphus hirsutus integrifolius* Choisy, in DC. Prodr. 13: 433. 1849.

*Oxybaphus nyctagineus pilosus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.

*Mirabilis hirsuta* MacM. Metasp. Minn. Valley 217. 1892.

*Mirabilis nyctaginea hirsuta* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Mirabilis nyctaginea pilosa* Heimerl, Beitr. Syst. Nyct. 23, in part. 1897.

*Allionia pilosa* Rydb. Bull. Torrey Club 29: 690. 1902.

*Allionia aggregata* Rydb. Bull. Torrey Club 29: 692. 1902. Not *A. aggregata* Spreng. 1825.

*Allionia hirsuta rotundifolia* Lunell, Bull. Leeds Herb. 2: 6. 1908.

*Allionia hirsuta coloradensis* Standley, Contr. U. S. Nat. Herb. 12: 353. 1909.

*Allionia chersophila* Standley, Contr. U. S. Nat. Herb. 12: 354. 1909.

*Allionia hirsuta aggregata* A. Nelson; Coult. & Nels. Man. 173, in part. 1909.

*Allionia pilosa decumbens* A. Nelson; Coult. & Nels. Man. 173, in part. 1909. Not *Calymenia decumbens* Nutt. 1818.

Stems solitary or few, erect or decumbent, 2–10 dm. high, usually very stout, simple or sparsely branched below the inflorescence, green or glaucescent, densely hirsute or long-pilose near the base and usually up to the inflorescence, sometimes merely puberulent, but always hirsute about the nodes, the internodes usually elongate; petioles 5 mm. long or shorter, very stout, usually wanting; leaf-blades mostly ovate-oblong, sometimes lance-linear or broadly ovate, 3–11 cm. long, 0.4–5 cm. wide, subcordate to long-attenuate at the base, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, thick and succulent or sometimes thin, usually bright-green, densely hirsute or long-pilose or often merely viscid-puberulent or, in age, glabrate; inflorescence in young plants often wholly of axillary involucre, in mature plants cymose-paniculate, copiously or sparsely branched, the branches mostly opposite, densely viscid-pilose, bearing few reduced bractlike leaves; involucre commonly 3-flowered,



slender-pedunculate, 4–5 mm. long in anthesis, in age 10–18 mm. long, densely or sparsely viscid-pilose, the lobes broad, rounded or obtuse; perianth 8–10 mm. long, sparsely pilose, pink; stamens 3–5, long-exserted; fruit obovoid, 4–5 mm. long, dark-olivaceous, densely short-pilose, the angles broad, smooth or nearly so, the sides rugose or short-tuberculate; seed obovoid, 3 mm. long, brownish-stramineous.

TYPE LOCALITY: "Upper Louisiana."

DISTRIBUTION: Dry fields and hillsides, Wyoming to Manitoba and Wisconsin, southward to Missouri, Texas, and New Mexico; rarely adventive eastward.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1418; ed. 2, f. 1728.

## 12. *Allionia pauciflora* (Buckl.) Standley.

*Oxybaphus pauciflorus* Buckl. Proc. Acad. Phila. 1862: 7. 1862.

*Allionia gigantea* Standley, Contr. U. S. Nat. Herb. 12: 348. 1909.

*Oxybaphus giganteus* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems solitary or few, 5–15 dm. high, erect or decumbent, very stout, simple or sparsely branched below the inflorescence, green or glaucescent, densely puberulent throughout, the internodes usually short; petioles 5 mm. long or shorter, very stout, most of the leaves sessile; leaf-blades ovate-oblong to rhombic-ovate, ovate-deltoid, or rounded-ovate, 3.5–10 cm. long, 1.5–7.5 cm. wide, subcordate or rounded at the base and often abruptly short-decurrent, rounded or obtuse at the apex, entire or subsinuate, bright-green, or glaucescent beneath, thick and succulent, densely puberulent or sometimes glabrate; inflorescence paniculate, copiously or sparsely branched, the branches slender or stout, opposite, densely viscid-puberulent or short-pilose, bearing few or numerous reduced bractlike leaves; involucre slender-pedunculate, mostly 3-flowered, about 4 mm. long at anthesis, 8–12 mm. long in fruit, densely or sparsely pilose, the lobes short, rounded; perianth about 8 mm. long, pale-pink, short-pilose, the limb about 12 mm. broad; stamens 3–5, long-exserted; fruit obovoid, 4–5 mm. long, dark-olivaceous, hirtellous, the angles broad, coarsely tuberculate or composed of large distinct tubercles, the sides also tuberculate; seed obovoid, 3 mm. long, brownish-stramineous.

TYPE LOCALITY: On the San Saba River, north of Fort Mason, Texas.

DISTRIBUTION: Oklahoma and Texas.

## 13. *Allionia albida* Walt. Fl. Car. 84. 1788.

*Calymenia albida* Nutt. Gen. 1: 26. 1818.

*Oxybaphus albidus* Sweet, Hort. Brit. 2: 429. 1827.

*Calymenia granulata* Raf. Aut. Bot. 15. 1840.

*Oxybaphus angustifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 433, in part. 1849. Not *O. angustifolius* Sweet. 1827.

*Mirabilis nyctaginea albida* Heimerl, Beitr. Syst. Nyct. 22. 1897.

*Mirabilis albida* Heimerl, Ann. Cons. Jard. Genève 5: 182. 1901.

*Mirabilis albida uniflora* Heimerl, Ann. Cons. Jard. Genève 5: 182. 1901.

*Allionia bracteata* Rydb. Bull. Torrey Club 29: 690. 1902.

*Allionia decumbens* Rydb. Bull. Torrey Club 29: 692. 1902. Not *A. decumbens* Spreng. 1825.

*Allionia lanceolata* Standley, Contr. U. S. Nat. Herb. 12: 355, in part. 1909. Not *A. lanceolata* Rydb. 1902.

*Allionia lanceolata uniflora* Standley, Contr. U. S. Nat. Herb. 12: 355. 1909.

Stems solitary or few, 2–12 dm. high, erect or decumbent, stout or slender, simple or sparsely branched below the inflorescence, glaucous or glaucescent, glabrous or bifariously puberulent, the internodes elongate or often very short; petioles 5 mm. long or shorter, stout, usually wanting; leaf-blades mostly narrowly lanceolate, sometimes linear to ovate, 4.5–10 cm. long, 0.3–2.8 cm. wide, acute to long-attenuate at the base, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, usually thick and succulent, bright-green, or often very glaucous beneath, glabrous or very sparsely short-pilose; inflorescence often wholly of axillary involucre in young plants, in mature plants cymose-paniculate, copiously branched, the branches slender or stout, opposite or alternate, puberulent or shortly viscid-pilose, often bearing very numerous reduced bractlike leaves; involucre 1–3-flowered, slender-pedunculate, about 4 mm. long at anthesis, 8–14 mm. long in fruit, densely or sparsely viscid-pilose, the lobes short, rounded; perianth 8–10 mm. long, pale-pink, sparsely pilose; stamens 3–5, exserted; fruit obovoid, 5 mm. long, dark-olivaceous, short-hirtellous, the angles broad and coarsely



tuberculate or composed of distinct tubercles, the sides also tuberculate; seed obovoid, 3.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Meadows and hillsides, South Carolina and Georgia to Tennessee, Kansas, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1417; ed. 2, f. 1727.

14. *Allionia lanceolata* Rydb. Bull. Torrey Club 29: 691. 1902.

*Allionia sessilifolia* Osterhout, Bull. Torrey Club 32: 611. 1905.

Stems few or solitary, erect or ascending, 4–10 dm. high, stout, simple or sparsely branched below the inflorescence, sparsely puberulent or glabrate below, short-pilose above with mostly viscid hairs, the internodes short or elongate; leaf-blades sessile or on very stout petioles 4 mm. long or shorter, lanceolate or lance-ovate, 3.5–10 cm. long, 1–4 cm. wide, usually rounded at the base but sometimes obtuse or acute, gradually narrowed to the obtuse or acutish apex, entire or subsinuate, bright-green, or glaucescent beneath, glabrous or sparsely short-pilose, usually ciliolate; inflorescence paniculate, much branched, the branches slender, opposite, shortly viscid-pilose; involucre slender-pedunculate, about 4 mm. long at anthesis, in age about 1 cm. long, densely viscid-pilose, the lobes oval, rounded at the apex; flowers usually 3 in each involucre, the perianth about 8 mm. long, sparsely pilose, pink; stamens 5, exserted; fruit obovoid, 5 mm. long, dark-olivaceous, finely hirtellous, the angles narrow, smooth, the sides rugose or short-tuberculate; seed obovoid, 2.5–3 mm. long, brownish-stramineous.

TYPE LOCALITY: Estes Park, Larimer County, Colorado.

DISTRIBUTION: Southern Wyoming and northern Colorado.

15. *Allionia aggregata* (Ortega) Spreng. Syst. 1: 384. 1825.

*Calyxhymenia aggregata* Ortega, Dec. 81. 1798.

*Mirabilis aggregata* Cav. Ic. 5: 22. 1799.

*Calymenia aggregata* Pers. Syn. Pl. 1: 37. 1805.

*Oxybaphus aggregatus* Vahl, Enum. 2: 41. 1806.

*Allionia albida* Coult. Contr. U. S. Nat. Herb. 2: 352, in part. 1894. Not *A. albida* Walt. 1788.

*Mirabilis pseudaggregata* Heimerl, Ann. Cons. Jard. Genève 5: 183. 1901.

*Mirabilis pseudaggregata subhirsuta* Heimerl, Ann. Cons. Jard. Genève 5: 184. 1901.

*Mirabilis pseudaggregata eglandulosa* Heimerl, Ann. Cons. Jard. Genève 5: 184. 1901.

*Allionia trichodonta* Standley, Contr. U. S. Nat. Herb. 12: 354. 1909.

*Allionia pseudaggregata* Standley, Contr. U. S. Nat. Herb. 12: 356. 1909.

*Allionia pseudaggregata subhirsuta* Standley, Contr. U. S. Nat. Herb. 12: 356. 1909.

*Allionia hirsuta aggregata* A. Nelson; Coult. & Nels. Man. 173, in part. 1909.

*Oxybaphus pseudaggregatus* Weatherby, Proc. Am. Acad. 45: 425. 1910.

Stems few or numerous, stout, erect or decumbent, 1.5–10 dm. high, sparsely branched or simple below the inflorescence, usually glabrous below but sometimes bifariously puberulent or short-pilose, glabrate, puberulent, or short-pilose above with mostly viscid hairs, or rarely sparsely hirsute, the internodes usually elongate; leaf-blades sessile or on very short stout petioles, linear-lanceolate, lanceolate, lance-oblong, or lance-ovate, 1.2–10 cm. long, 0.3–3 cm. wide, acute to long-attenuate at the base, gradually narrowed to the acute or obtuse apex, entire or sinuate, thick and succulent, green, or glaucescent beneath, glabrous or sparsely hirsute or short-pilose, often ciliate; involucre usually all axillary in young plants, in mature plants arranged in an ample cymose inflorescence, this sparsely branched, the branches slender, alternate, viscid-pilose, bearing few or numerous reduced bractlike leaves, the involucre slender-pedunculate, viscid-pilose, at anthesis 4–5 mm. long, in age 6–9 mm. long, the lobes ovate or oval, acutish or rounded; flowers usually 3 in each involucre, the perianth 8–10 mm. long, sparsely pilose, pink; stamens 3–5, exserted; fruit broadly obovoid, 3.5–5 mm. long, brownish or olivaceous, short-hirtellous, the angles broad, smooth or nearly so, the sides rugose or short-tuberculate; seed oval or obovoid, 2.5–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Western Texas and Chihuahua to the State of Mexico.

ILLUSTRATIONS: Ortega, Dec. pl. 11; Cav. Ic. pl. 437.

16. *Allionia coahuilensis* Standley, Contr. U. S. Nat. Herb. 12: 347. 1909.

*Allionia Greggii* Standley, Contr. U. S. Nat. Herb. 12: 348. 1909.

*Oxybaphus coahuilensis* Weatherby, Proc. Am. Acad. 45: 425. 1910.



Stems few, from a thick woody root, erect, 6–10 dm. high, simple or sparsely branched below the inflorescence, stout, glaucescent, densely puberulent below, short-pilose above; petioles stout, 1.5 cm. long or shorter, very short in the uppermost leaves, pilose; leaf-blades ovate, ovate-oblong, or deltoid-lanceolate, 2.5–5 cm. long, 0.7–2 cm. wide, obtuse or truncate at the base and decurrent, narrowed to the obtuse or acutish apex, entire or undulate, succulent, thick-coriaceous when dry, glaucescent beneath, densely puberulent or short-pilose; inflorescence cymose-paniculate, copiously branched, the branches rather slender, mostly alternate, densely viscid-pilose, bearing numerous reduced bractlike sessile leaves; involucre numerous, 3-flowered, short-pedunculate, 4–5 mm. long at anthesis, about 8 mm. long in fruit, densely viscid-pilose with fulvous hairs, the lobes shorter than the tube, ovate-orbicular, broadly obtuse; perianth 10–12 mm. long, sparsely pilose; stamens 5, exserted; fruit obovoid, 4–5 mm. long, brownish-olivaceous, minutely pilose, the angles broad, smooth, the sides rugulose or short-tuberculate; seed broadly obovoid, 2–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Vicinity of the type locality.

17. *Allionia pumila* Standley, Contr. U. S. Nat. Herb. 12: 345. 1909.

*Oxybaphus nyctagineus pilosus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859. Not *Allionia pilosa* Nutt. 1818.

*Allionia Brandegei* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

*Allionia pachyphylla* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

*Allionia comata* Standley, Contr. U. S. Nat. Herb. 12: 348, in part. 1909. Not *A. comata* Small, 1903.

*Oxybaphus Brandegei* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or usually numerous, from a thick woody root, ascending or procumbent, 1–5 dm. long, very stout, much branched, the branches mostly divaricate, sometimes ascending, whitish, densely pilose with short soft hairs, or rarely glabrate in age, the internodes usually elongate; petioles stout, 2.5 cm. long or shorter, those of the uppermost leaves usually very short, densely pilose; leaf-blades mostly deltoid or ovate-deltoid, 1.5–5 cm. long, 1.3–4 cm. wide, truncate or subcordate at the base and often abruptly short-decurrent, rounded to acutish at the apex, entire or subsinuate, very thick and succulent, thick-coriaceous when dry, yellowish-green above, glaucous or glaucescent beneath, densely puberulent or short-pilose; inflorescence in young plants often wholly of axillary involucre, in mature plants a small narrow cyme, this sparsely branched, the branches stout, alternate, densely viscid-pilose, usually with numerous small broad reduced bractlike leaves; involucre few, short-pedunculate, 3-flowered, at anthesis 3–4 mm. long, in age about 8 mm. long, densely viscid-pilose with short fulvous hairs, the lobes ovate-orbicular, rounded or acutish; perianth 8–10 mm. long, sparsely pilose, pale-pink, the limb about 12 mm. broad, stamens usually 3, long-exserted; fruit obovoid, 5 mm. long, brownish-olivaceous, short-pilose, the angles narrow, smooth, or rugose on their sides, the sides of the fruit rugulose; seed broadly obovoid, 2.5–3 mm. long, pale yellowish-brown.

TYPE LOCALITY: Kingman, Arizona.

DISTRIBUTION: Dry plains and hillsides, western New Mexico to Nevada and southeastern California.

18. *Allionia rotundifolia* Greene, Pl. Baker. 3: 33. 1901.

*Allionia polytricha* Standley, Contr. U. S. Nat. Herb. 12: 346. 1909.

Stems few, from a thick woody root, erect or ascending, 3–7 dm. long, very stout, sparsely branched, the branches ascending, pale, densely hirsute below with stiff fulvous hairs, the internodes elongate; petioles very stout, those of the lowest leaves one third as long as the blades, those of the upper leaves very short or wanting, hirsute; leaf-blades ovate-deltoid to deltoid-orbicular or even orbicular, 7 cm. long and 6 cm. wide or smaller, rounded or subcordate at the base, obtuse to rounded at the apex, thick-coriaceous, entire, yellowish-green, above, usually glaucescent beneath, more or less hirsute when young, especially along the veins, glabrate in age; inflorescence cymose, sparsely branched, the branches stout, alternate, densely



viscid-pilose with fulvous hairs, bearing numerous reduced sessile bractlike leaves; involucre few, short-pedunculate, 3-flowered, at anthesis 4–6 mm. long, densely viscid-pilose with short fulvous hairs, the lobes broadly ovate or ovate-orbicular, rounded or acutish at the apex; perianth sparsely pilose; fruit obovoid, 4–5 mm. long, puberulent, the angles narrow, smooth, the sides rugulose.

TYPE LOCALITY: Swallow's, between Pueblo and Canyon City, Colorado.

DISTRIBUTION: Vicinity of the type locality.

### 19. *Allionia nyctaginea* Michx. Fl. Bor. Am. 1: 100. 1803.

*Allionia ovata* Pursh, Fl. Am. Sept. 97. 1814.

*Calymenia nyctaginea* Nutt. Gen. 1: 26. 1818.

*Oxybaphus nyctagineus* Sweet, Hort. Brit. 1: 334. 1826.

*Calyxhymenia paniculata* Desf. Cat. Hort. Par. 390. 1829.

*Allionia cucullata* Fisch. Mey. & Avé-Lall. Ind. Sem. Hort. Petrop. 9: 55. 1843.

*Oxybaphus glabrifolius minor* Choisy, in DC. Prodr. 13<sup>2</sup>: 431. 1849.

*Oxybaphus Cervantesii grandifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus floribundus* Choisy, in DC. Prodr. 13<sup>2</sup>: 433. 1849.

*Oxybaphus cucullatus* Choisy, in DC. Prodr. 13<sup>2</sup>: 434. 1849.

*Oxybaphus nyctagineus latifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859.

*Oxybaphus nyctagineus oblongifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859.

*Allionia floribunda* Kuntze, Rev. Gen. 533. 1891.

*Mirabilis nyctaginea* MacM. Metasp. Minn. Valley 217. 1892.

*Allionia nyctaginea ovata* Morong, Mem. Torrey Club 5: 146. 1894.

*Mirabilis nyctaginea oblongifolia* Heimerl, Beitr. Syst. Nyct. 23, excluding description. 1897.

*Mirabilis oblongifolia* Heimerl, Ann. Cons. Jard. Genève 5: 181, excluding description. 1901.

*Allionia oblongifolia* Small, Fl. SE. U. S. 407, excluding description. 1903.

*Allionia latifolia* Standley, Contr. U. S. Nat. Herb. 12: 350. 1909.

*Allionia foliosa* Standley, Contr. U. S. Nat. Herb. 13: 409. 1911.

Stems numerous from an elongate, somewhat fleshy root, erect or decumbent, stout, 3–12 dm. high, simple or sparsely branched below, green or glaucescent, glabrous or bifariously puberulent; petioles slender, 1–3 cm. long, glabrous or sparsely puberulent; leaf-blades mostly deltoid or ovate-deltoid, sometimes ovate-cordate, ovate, or ovate-oblong, 4–12 cm. long, 1.5–9 cm. wide, cordate to rounded at the base, acute to attenuate at the apex or rarely rounded, entire or subsinuate, thin, bright-green, glabrous, usually ciliolate; inflorescence sometimes wholly of axillary involucre but usually cymose, the cymes small and dense, leafy, the branches alternate, slender, pilose; involucre on slender elongate peduncles, 3-flowered, 5–6 mm. long in anthesis, in age 10–17 mm. long, puberulent or short-pilose near the base, the lobes short, rounded or obtuse, often apiculate, glabrous, long-ciliate; perianth about 10 mm. long, glabrous or very sparsely villous, white or pale-pink, the limb 12–15 mm. broad; stamens 3–5, exserted; fruit obovoid, 5 mm. long, dark-brown or olivaceous, densely short-pilose, the angles broad, more or less rugulose, the sides rugulose or finely tuberculate; seed broadly obovoid, 3 mm. long, pale-brown.

TYPE LOCALITY: Banks of the Tennessee River.

DISTRIBUTION: Montana to Wisconsin, southward to Colorado, Texas, and Alabama; Oaxaca; frequently adventive in the eastern United States.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1416; ed. 2. f. 1729; Iowa Geol. Surv. Bull. 4: f. 68.

### 20. *Allionia Grayana* Standley, sp. nov.

*Oxybaphus nyctagineus latifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.

*Allionia nyctaginea latifolia* Coult. Contr. U. S. Nat. Herb. 2: 352, in part. 1894.

*Allionia latifolia* Standley, Contr. U. S. Nat. Herb. 12: 350, excluding synonym. 1909.

Stems erect, 3–12 dm. high, simple or sparsely branched below the inflorescence, glaucescent, glabrous below or bifariously puberulent; petioles slender or stout, 0.5–2 cm. long, the uppermost leaves often sessile; leaf-blades deltoid or rounded-deltoid, sometimes broadly ovate, 2.5–5.5 cm. long, 1.5–3.5 cm. wide, subcordate, truncate, or rounded at the base, rounded or very obtuse at the apex or rarely acute, entire or subundulate, subcoriaceous when dry, often glaucescent beneath, sparsely pilose or glabrous, often ciliolate; inflorescence cymose-paniculate, usually much branched, the branches slender, mostly opposite, viscid-pilose, usually bearing numerous reduced bractlike leaves; involucre numerous, 3-flowered, slender-pedunculate, 4–5 mm. long in anthesis, 10–14 mm. long in fruit, densely viscid-pilose, the lobes rounded-ovate, commonly rounded at the apex but sometimes acutish; perianth about 10 mm. long,



sparsely pilose, pink; stamens usually 5, exserted; fruit broadly obovoid, 4 mm. long, dark-brown, finely pilose, the angles narrow, tuberculate, the sides finely and closely tuberculate; seed broadly obovoid, 2.5–3 mm. long, pale-brown.

Type collected in western Texas in 1849, *Charles Wright 603* (U. S. Nat. Herb. no. 22766).  
DISTRIBUTION: Western Texas.

21. *Allionia suffruticosa* Standley, Contr. U. S. Nat. Herb. 13: 408.  
1911.

Plants suffrutescent below and much branched, 3–5 dm. high, the branches slender, terete, ascending, glaucescent and glabrous below, the middle internodes greenish, bifariously puberulent, the internodes elongate; petioles slender, 5–10 mm. long, glabrous or minutely puberulent; leaf-blades deltoid or deltoid-ovate, 2–4 cm. long, 1–2.5 cm. wide, entire or subundulate, thin, bright-green, sparsely pilose or glabrous, subcordate to rounded at the base, obtuse or acute at the apex; inflorescence of few small cymes, these sparsely branched, the branches very slender, alternate, viscid-pilose, bearing few or numerous reduced sessile bractlike leaves; involucre few, 3-flowered, 5 mm. long at anthesis, 8 mm. long in fruit, densely viscid-pilose with fulvous hairs, the lobes ovate or oval, rounded or obtuse; perianth 10–12 mm. long, sparsely pilose, pink; fruit broadly obovoid, 5 mm. long, dark-brown, sparsely short-pilose, the angles very prominent, composed of distinct tubercles, the sides broad, very finely tuberculate; seed broadly obovoid, 3.5 mm. long, brownish-stramineous.

TYPE LOCALITY: Los Naranjos, Oaxaca.  
DISTRIBUTION: Oaxaca.

22. *Allionia comata* Small, Fl. SE. U. S. 407. 1903.

*Oxybaphus nyctagineus Cervantesii* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174. 1859. Not *Calyxhymenia Cervantesii* Desf. 1829.  
*Oxybaphus nyctagineus oblongifolius* A. Gray, in Torr. Bot. Mex. Bound. Surv. 174, in part. 1859.  
*Oxybaphus viscosus* Hemsl. Biol. Centr. Am. Bot. 3: 3, in part. 1882. Not *O. viscosus* L'Hér. 1849.  
*Oxybaphus Cervantesii* S. Wats. Proc. Am. Acad. 18: 142. 1883.  
*Allionia nyctaginea Cervantesii* Coult. Contr. U. S. Nat. Herb. 2: 352. 1894. Not *A. Cervantesii* Steud. 1840.  
*Mirabilis nyctaginea setigera* Heimerl, Beitr. Syst. Nyct. 22. 1897.  
*Mirabilis nyctaginea oblongifolia* Heimerl, Beitr. Syst. Nyct. 23, in part. 1897.  
*Mirabilis nyctaginea Cervantesii* Heimerl, Beitr. Syst. Nyct. 23. 1897.  
*Mirabilis nyctaginea alpicola* Heimerl, Beitr. Syst. Nyct. 23. 1897.  
*Allionia pratensis* Standley, Contr. U. S. Nat. Herb. 12: 351. 1909.  
*Allionia melanotricha* Standley, Contr. U. S. Nat. Herb. 12: 351. 1909.  
*Oxybaphus melanotrichus* Weatherby, Proc. Am. Acad. 45: 425. 1910.  
*Oxybaphus comatus* Weatherby, Proc. Am. Acad. 49: 492. 1913.  
*Oxybaphus pratensis* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few or solitary, from a woody root, usually erect, sometimes decumbent, 3–12 dm. high, stout or slender, simple or sparsely branched below the inflorescence, sometimes with weak sterile branches at the base, green, or glaucescent below, glabrous below or bifariously puberulent, very rarely pilose with soft viscid fulvous hairs, pilose or short-pilose above but the pubescence usually bifarious below the inflorescence, the internodes usually elongate; petioles slender, 1–5 cm. long, glabrous or puberulent, rarely white-pilose in the earliest leaves; leaf-blades usually elongate-deltoid but sometimes deltoid, ovate, or lanceolate, 3–10 cm. long, 0.8–5.5 cm. wide, subcordate or truncate at the base or sometimes cordate, obtuse, or acutish, acute or attenuate at the apex or often obtuse, rarely rounded, entire or subundulate, thin, bright-green, sparsely viscid-puberulent or short-pilose or glabrous, commonly ciliolate; inflorescence cymose-paniculate, usually narrow and sparsely branched, sometimes broad and loosely branched, the branches slender, alternate, viscid-pilose with fulvous hairs, bearing very few bractlike leaves; involucre few or numerous, usually short-pedunculate, 3–5 mm. long at anthesis, about 8 mm. long in fruit, densely viscid-pilose with fulvous or often black hairs, the lobes oval-oblong, usually longer than the tube and rounded at the apex; perianth 10–12 mm. long, purplish-red, sparsely pilose, the limb sometimes 20 mm. broad; stamens 3–5, long-exserted; fruit obovoid, 3–4.5 mm. long, brownish- or blackish-olivaceous, minutely



pilose, the angles broad, usually tuberculate, the sides coarsely or finely tuberculate; seed obovoid, 2–3 mm. long, brownish-stramineous.

TYPE LOCALITY: New Mexico, probably about Santa Rita.

DISTRIBUTION: Meadows and thickets in the mountains, Arizona to western Texas, southward to Sonora and Puebla.

### 23. *Allionia longipes* Standley, sp. nov.

*Allionia melanotricha* Standley, Contr. U. S. Nat. Herb. 13: 409, in part. 1911.

Plants about a meter high, copiously branched below, the branches stout, ascending, glaucescent, bifariously puberulent, the internodes elongate; petioles slender, 2–5.5 cm. long, puberulent; leaf-blades deltoid-cordate, 2–5.5 cm. long, 2–4.5 cm. wide, deeply cordate at the base and subdecurent, acute or attenuate at the apex, entire, thin, bright-green, minutely puberulent or glabrate, ciliolate; inflorescence cymose-paniculate, about 30 cm. long, copiously branched, the branches chiefly alternate, stout, viscid-pilose with fulvous hairs, very sparsely bracteate; involucres numerous, 3-flowered, slender-pedunculate, 4–5 mm. long at anthesis and 7–8 mm. in fruit, densely fulvous-pilose, the lobes short, deltoid-ovate or rounded-ovate, acute or acutish, at least in fruit; perianth about 12 mm. long, sparsely pilose; stamens 3, short-exserted; fruit obovoid, 5 mm. long, brownish-olivaceous, densely short-pilose, the angles broad, smooth or slightly rugulose, the sides rugulose; seed obovoid, 3 mm. long, pale-brown.

Type collected in the vicinity of Durango, State of Durango, in 1896, *Edward Palmer* 261 (U. S. Nat. Herb. no. 304437).

### 24. *Allionia ciliata* Standley, Contr. U. S. Nat. Herb. 12: 345. 1909.

*Oxybaphus aggregatus* A. Gray, in Torr. Bot. Mex. Bound. Surv. 168. 1859. Not *O. aggregatus* Vahl, 1806.

*Allionia deltoidea* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

*Oxybaphus ciliatifolius* Weatherby, Proc. Am. Acad. 49: 492. 1913.

Stems few, from a slender woody root, 2–4 dm. high, rather slender, copiously branched, glaucous, glabrous or bifariously puberulent, the lower internodes short, the upper elongate; petioles stout, 0.5–2 cm. long, sparsely pilose with stout white hairs; leaf-blades elongate-deltoid, ovate-deltoid, or deltoid-lanceolate, 0.5–1.8 cm. wide, entire or subundulate, succulent, coriaceous when dry, glaucous or glaucescent beneath, sparsely pilose or glabrate, long-ciliate, at least near the base; inflorescence of numerous small dense cymes, or of axillary involucres in young plants, the branches slender, puberulent and pilose; involucres 3-flowered, short-pedunculate, about 4 mm. long at anthesis and 8 mm. in fruit, densely white-pilose, the lobes short, broadly ovate or ovate-orbicular, acute or acutish, at least in age; perianth about 1 cm. long, very sparsely pilose or glabrous, the limb about 15 mm. broad; stamens 5, exserted; fruit broadly obovoid, 3.5–4 mm. long, dark-brown, sparsely and minutely pilose, the angles broad, obscurely rugulose, the sides also slightly rugulose; seed globose-obovoid, 2 mm. long, pale-brown.

TYPE LOCALITY: Smiths Run, western Texas.

DISTRIBUTION: Western Texas and Coahuila.

### 25. *Allionia violacea* L. Syst. ed. 10. 890. 1759.

*Oxybaphus violaceus* Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.

*Oxybaphus violaceus parviflorus* Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.

*Mirabilis violacea* Heimerl, Beitr. Syst. Nyct. 23. 1897.

*Allionia mollis* Standley, Contr. U. S. Nat. Herb. 13: 405. 1911.

Stems few or numerous, slender, ascending or procumbent, 2–10 dm. long, much branched, the branches slender, green, bifariously puberulent or glabrate, sometimes viscid-pilose, the internodes much elongate; petioles slender, 1–6 cm. long, sparsely or densely pilose; leaf-blades mostly broadly ovate-deltoid, sometimes ovate-oblong or elongate-deltoid, 2–8 cm. long, 1.5–5 cm. wide, subcordate or truncate at the base, usually attenuate or long-attenuate at the apex, rarely obtuse or rounded, entire or subundulate, thin, bright-green, sparsely puberu-



lent or short-pilose or glabrate; inflorescence cymose, the cymes usually small and congested, or open in age, often leafy, the branches very slender, viscid-pilose; involucre few, on long or short, slender peduncles, about 3 mm. long in anthesis, in fruit 5–6 mm. long, green, viscid-pilose, the lobes triangular-ovate, unequal, usually acute or acuminate; perianth 6–8 mm. long, purplish-red, viscid-pilose; stamens usually 3, short-exserted; fruit obovoid, 3.5–4 mm. long, terete, dark-brown or blackish, short-pilose, sparsely and irregularly tuberculate; seed oval-obovoid, 2.5 mm. long, pale yellowish-brown.

TYPE LOCALITY: Cumana, Venezuela.

DISTRIBUTION: Veracruz and Mexico (State) to Yucatán and Costa Rica; also in Colombia and Venezuela.

#### EXCLUDED SPECIES

ALLIONIA CERVANTESII (Sweet) Steud. Nom. Bot. ed. 2. 1: 50. 1840. (*Oxybaphus Cervantesii* Sweet, Brit. Fl. Gard. 1: pl. 81. 1825.) Described from cultivated plants said to have come from South America. The species has often been reported from Mexico, but no North American specimens seen by the writer agree with the original description and illustration.

ALLIONIA CORDATA (Kunze) Kuntze, Rev. Gen. 533. 1891. (*Oxybaphus cordifolius* Kunze; Choisy, in DC. Prodr. 13<sup>2</sup>: 432. 1849.) Reported doubtfully from Mexico by Choisy (in DC. Prodr. 13<sup>2</sup>: 432. 1849). The species appears to be exclusively South American.

OXYBAPHUS OVATUS (R. & P.) Vahl, Enum. 2: 41. 1806. (*Calyxhymenia ovata* R. & P. Fl. Per. 1: 45. 1798.) Reported doubtfully from Mexico by Choisy (in DC. Prodr. 13<sup>2</sup>: 431. 1849), but the specimens upon which the report was made were, undoubtedly, wrongly identified, the species being a South American one.

### 21. ALLIONIELLA Rydb. Bull. Torrey Club 29: 687. 1902.

Perennial herbs with dichotomous stems, the branches swollen at the nodes, more or less glandular-pubescent. Leaves opposite, petiolate, the blades broad, entire or nearly so. Flowers involucre; involucre 3-flowered, broadly campanulate at anthesis, nearly rotate when mature and slightly accrescent, green and calyx-like, 5-lobed, the lobes unequal, erect, imbricate; perianth short-funnelform, corolla-like, purplish-red, the tube short, stout, constricted above the ovary, the limb 5-lobed, induplicate-plicate. Stamens 3, unequal; filaments capillary, free; anthers didymous. Ovary ellipsoid; style filiform, exserted; stigma capitate. Anthocarp coriaceous, ellipsoid, smooth or obscurely transverse-ridged, glabrous. Seed with the testa adherent to the pericarp; embryo uncinate, the cotyledons enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Quamoclidion oxybaphoides* A. Gray.

#### 1. *Allioniella oxybaphoides* (A. Gray) Rydb. Bull. Torrey Club 29: 687. 1902.

*Quamoclidion oxybaphoides* A. Gray, Am. Jour. Sci. II. 15: 320. 1853.

*Mirabilis oxybaphoides* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Oxybaphus Wrightii* Hemsl. Biol. Centr. Am. Bot. 3: 3. 1882.

*Allionia oxybaphoides* Kuntze, Rev. Gen. 533. 1891.

*Mirabilis oxybaphoides glabrata* Heimerl, Ann. Cons. Jard. Genève 5: 180. 1901.

*Allioniella oxybaphoides glabrata* Standley, Contr. U. S. Nat. Herb. 12: 357. 1909.

Plants ascending or decumbent, from a thick fleshy root, much branched, usually forming dense clumps 4–12 dm. in diameter, the branches slender, green or whitish, densely viscid-villous with short hairs, or rarely glabrate, the internodes elongate; petioles slender or stout, 1–4 cm. long, viscid-villous or glabrate; leaf-blades deltoid-cordate or deltoid, often broadly so, 1.5–7 cm. long, 1.5–6 cm. wide, usually cordate at the base and broadly short-decurrent, sometimes truncate, acute to attenuate at the apex, often abruptly so, entire or undulate, thin, bright-green, viscid-villous, especially when young, or glabrate, ciliate; inflorescence cymose or axillary, the cymes few-flowered, leafy; peduncles slender, solitary, usually longer than the involucre, viscid-villous; involucre about 5 mm. long at anthesis and 1–1.5 cm. broad in age, viscid-villous, the lobes narrowly or broadly triangular, acute or attenuate,



very unequal, usually longer than the tube; perianth 7–10 mm. long, sparsely pilose or glabrate, the limb 6–8 mm. broad; fruit ellipsoid or subglobose, 2.5–3 mm. long, olivaceous, marked with small elongate black spots or slightly elevated transverse ridges.

TYPE LOCALITY: East of El Paso, Texas.

DISTRIBUTION: Dry stony or brushy hillsides, southern Colorado and Utah to Arizona and western Texas.

## 22. QUAMOCLIDION Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

Perennial herbs, with repeatedly dichotomous stems, glabrous or glandular-pubescent, the branches swollen at the nodes. Leaves opposite, petiolate, the blades broad, succulent, entire. Flowers involucre; involucre 3–8-flowered, campanulate, 4–5-lobed, calyx-like, green or colored, slightly accrescent in age, the lobes erect, imbricate; perianth funnellform or nearly tubular, corolla-like, purplish or deep-red, the tube slender or stout, constricted above the ovary, the limb 5-lobed, induplicate-plicate. Stamens 5, unequal; filaments capillary, incurved, connate at the base into a short fleshy cup; anthers didymous. Ovary ellipsoid; style filiform, exserted; stigma capitate, papillose. Anthocarp coriaceous, oblong or obovoid to ellipsoid, smooth or obscurely 5-angulate and rugulose, glabrous or puberulent. Seed with the testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the copious farinaceous endosperm; radicle elongate, descending.

Type species, *Mirabilis triflora* Benth.

Perianth 2–2.5 cm. long, the limb scarcely broader than the tube; involucre 3-flowered; stamens long-exserted.

1. *Q. triflorum*.

Perianth 4–6 cm. long, the limb much broader than the tube; involucre with more than 3 flowers; stamens only slightly if at all exserted.

Fruit angulate, slightly tuberculate; plants glabrous throughout, or obscurely puberulent on the young peduncles.

2. *Q. Greenei*.

Fruit terete, smooth; plants copiously pubescent, at least on the stems.

Perianth glandular-villous outside; fruit olive and brown, with 10 light-colored vertical lines.

3. *Q. Froebelii*.

Perianth glabrous or sparsely puberulent; fruit dark-brown to black.

4. *Q. multiflorum*.

### 1. *Quamoclidion triflorum* (Benth.) Standley, Contr. U. S. Nat.

Herb. 12: 358. 1909.

*Mirabilis triflora* Benth. Pl. Hartw. 23. 1839.

*Quamoclidion nyctagineum* Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849.

Plants erect or decumbent, much branched, the branches slender or stout, densely viscid-puberulent; petioles slender, 6–30 mm. long; leaf-blades broadly cordate-ovate, or the uppermost narrowly cordate-ovate, 2.5–7.5 cm. long, 2.5–5.5 cm. wide, cordate at the base, acute to attenuate at the apex, usually abruptly so, thin, bright-green, viscid-puberulent when young, glabrate in age, the leaves of the inflorescence much reduced, bractlike; peduncles axillary or glomerate at the ends of the branches, 2–12 mm. long; involucre 4-lobed, 3-flowered, broadly campanulate, 8–12 mm. long, densely viscid-puberulent with short hairs, the lobes unequal, longer than the tube, broadly ovate, abruptly or gradually acute or attenuate; perianth deep-red, tubular, 2–2.5 cm. long, 4 mm. in diameter, densely viscid-puberulent, the limb not broader than the tube, shallowly and obtusely lobed; filaments exserted 7–12 mm.; fruit elliptic-oblong in outline, 5 mm. long, nearly black, rugulose.

TYPE LOCALITY: Bolaños, Jalisco.

DISTRIBUTION: Cape Region of Lower California, and Jalisco.

ILLUSTRATION: F. & P. Nat. Pfl. 31<sup>b</sup>: f. 7, A.

### 2. *Quamoclidion Greenei* (S. Wats.) Standley, Contr. U. S. Nat.

Herb. 12: 358. 1909.

*Mirabilis Greenei* S. Wats. Proc. Am. Acad. 12: 253. 1876.

Plants erect or ascending, 4–6 dm. high, sparsely branched, glabrous throughout or sparsely and obscurely puberulent on the young peduncles, the branches stout, grayish-green; petioles stout, 0.4–3 cm. long; leaf-blades rhombic-orbicular, orbicular-ovate, or oblong-ovate, 4.5–7.5 cm. long, 2.5–6.5 cm. wide, broadly rounded to obtuse at the base and usually short-



decurrent, acute or obtuse to broadly rounded at the apex, thick and succulent, glaucescent; peduncles axillary or in terminal cymes, 1–5.5 cm. long, stout, the leaves of the inflorescence much reduced and bractlike, often deciduous; involucre campanulate, 2.5–4.5 cm. long, green or tinged with red, the 5 lobes equaling or shorter than the tube, broadly ovate or oval, obtuse to acute, usually abruptly apiculate; perianth 3.5–5 cm. long, purplish-red, glabrous, the tube 5–6 mm. in diameter, abruptly expanded into a shallowly 5-lobed limb 2.5–3 cm. broad; stamens equaling the perianth; fruit obovoid-oblong, 5 mm. long, nearly black, 5-angulate, rugulose, obscurely puberulent or glabrate.

TYPE LOCALITY: Mountain sides about Yreka, California.

DISTRIBUTION: In dry soil, northern California from Tehama County to Siskiyou County.

### 3. *Quamoclidion Froebelii* (Behr) Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Oxybaphus Froebelii* Behr, Proc. Calif. Acad. 1: 69. 1855.

*Mirabilis multiflora pubescens* S. Wats. Bot. Calif. 2: 2. 1880.

*Mirabilis Froebelii* Greene, Bull. Calif. Acad. 1: 124. 1885.

*Mirabilis multiflora Froebelii* M. E. Jones, Contr. West. Bot. 10: 49. 1902.

*Quamoclidion Froebelii glabratum* Standley, Contr. U. S. Nat. Herb. 12: 360. 1909.

*Mirabilis Froebelii glabrata* Jepson, Fl. Calif. 458. 1914.

Plants erect or ascending, 3–6 dm. high, much branched, the branches stout, densely short-villous and viscid throughout, or rarely glabrate; petioles stout, 0.3–3 cm. long; leaf-blades broadly deltoid-ovate, reniform-orbicular, rounded-ovate, or oblong-ovate, 4–10 cm. long, 2–7.5 cm. wide, rounded to broadly cordate at the base and short-decurrent, rounded to acute at the apex, often abruptly acute or apiculate, thick and succulent, pale-green, densely short-villous or puberulent and viscid on both surfaces or rarely glabrate; peduncles numerous, 0.4–3.5 cm. long, solitary in the lower axils and cymosely clustered at the ends of the branches, the cymes usually very leafy, the subtending leaves often much reduced and bractlike; involucre campanulate, usually 6–8-flowered, 2.2–3.5 cm. long, densely short-villous and glandular-puberulent, the 5 lobes equaling or usually shorter than the tube, triangular to ovate-oblong, acute or obtuse; perianth purplish-red, 3.5–4.5 cm. long, short-villous and viscid outside, the tube 4–8 mm. in diameter, expanded into a shallowly 5-lobed limb 2–2.5 cm. broad; stamens equaling or slightly exceeding the perianth; fruit elliptic-oval in outline, narrowed at both ends, about 8 mm. long and 6 mm. in diameter, olive mottled with brown, marked with 10 vertical light-colored lines, smooth, glabrous.

TYPE LOCALITY: Near Warner's Ranch, southern California.

DISTRIBUTION: In dry sandy soil, western Nevada, southeastern California, and northern Lower California.

### 4. *Quamoclidion multiflorum* Torr.; A. Gray, Am. Jour. Sci. II. 15: 321. 1853.

*Oxybaphus multiflorus* Torr. Ann. Lyc. N. Y. 2: 237. 1827.

*Allionia multiflora* Eaton, Man. ed. 6. 11. 1833.

*Nyctaginia* ? *Torreyana* Choisy, in DC. Prodr. 13<sup>2</sup>: 430. 1849.

*Mirabilis multiflora* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Quamoclidion multiflorum glandulosum* Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Quamoclidion multiflorum obtusum* Standley, Contr. U. S. Nat. Herb. 12: 359. 1909.

*Mirabilis multiflora glandulosa* F. Macbr. Contr. Gray Herb. 49: 49. 1917.

*Mirabilis multiflora obtusa* F. Macbr. Contr. Gray Herb. 49: 49. 1917.

Plants erect or ascending, 3–6 dm. high, much branched, often forming clumps a meter in diameter, the branches usually stout, densely leafy, glaucous or glaucescent, obscurely puberulent or finely short-villous and viscid, often glabrate; petioles slender or stout, 0.4–3.5 cm. long; leaf-blades broadly ovate-deltoid to reniform-orbicular or ovate-oblong, 2.5–7.5 cm. long, 1.5–7.5 cm. wide, cordate to rounded at the base and often short-decurrent, broadly rounded and apiculate to very acute at the apex, thick and succulent, glaucescent, glabrous to puberulent or short-villous and viscid or glandular-puberulent; peduncles slender or stout, 0.5–6 cm. long, solitary in the axils and cymosely clustered at the ends of the branches, the leaves of the inflorescence reduced; involucre campanulate, usually 6–8 flowered, 1.6–3.5 cm. long, glabrous, glandular-puberulent, or short-villous and viscid, green or tinged with red,



the 5 lobes equaling or usually shorter than the tube, ovate-orbicular to triangular, rounded and apiculate to very acute; perianth purplish-red, 4–5.5 cm. long, glabrous or glandular-puberulent outside, the tube 4–7 mm. thick, expanding into a shallowly 5-lobed limb 2.5–3 cm. broad; stamens equaling the perianth or usually slightly exserted; fruit elliptic-oblong in outline, narrowed at both ends, 8–10 mm. long, dark-brown to nearly black, smooth, glabrous.

TYPE LOCALITY: About the forks of the Platte River, Colorado.

DISTRIBUTION: In dry, chiefly sandy soil, southern Utah and Colorado to northern Chihuahua and western Texas.

ILLUSTRATIONS: Bot. Mag. *pl.* 6266; Contr. U. S. Nat. Herb. 13: *pl.* 77; Clements, Rocky Mt. Fl. *pl.* 8, *f.* 2.

#### DOUBTFUL SPECIES

QUAMOCLIDION ANGULATUM Choisy, in DC. Prodr. 13<sup>2</sup>: 429. 1849. (*Nyctago angulata* DC.; Choisy, in DC. Prodr. 13<sup>2</sup>: 429, as synonym. 1849.) Described from Mexico. The identity of the plant is problematical (see Standley, Contr. U. S. Nat. Herb. 13: 410. 1911).

### 23. HESPERONIA Standley, Contr. U. S. Nat. Herb. 12: 360. 1909.

Perennial herbs or shrubs, with repeatedly dichotomous stems, the nodes usually swollen, the plants usually pubescent and viscid. Leaves opposite, petiolate, or the upper sessile, the blades broad, succulent, entire or undulate. Flowers involucre, axillary; involucre 1-flowered, campanulate, only slightly accrescent in age, green, 5-lobed, the lobes slightly unequal, imbricate; perianth funnelform-campanulate, longer than the involucre, constricted above the ovary, the limb 5-lobed, induplicate-plicate, deciduous, the lobes retuse, red or white. Stamens 5, unequal; filaments capillary, incurved, connate at the base into a fleshy cup; anthers didymous. Ovary ellipsoid or globose; style filiform; stigma capitate, papillose. Anthocarp coriaceous, globose or oval, smooth, glabrous, often with 10 light-colored vertical lines. Seed with the testa adherent to the pericarp; embryo uncinat, the cotyledons enclosing the scanty endosperm; radicle elongate, descending.

Type species, *Mirabilis californica* A. Gray.

Fruit globose or depressed-globose, the diameter equaling or greater than the length.

Fruit oval or oblong to suborbicular in outline, the length greater than the diameter.

Involucral lobes lanceolate or oblong-lanceolate, longer than the tube.

Fruit 7–8 mm. long; involucre 9 mm. long.

Fruit 4–5 mm. long.

Involucre 7–9 mm. long; leaf-blades mostly 1.5–2.5 cm. long; plants usually slender, conspicuously viscid only about the inflorescence.

Involucre 10–13 mm. long; leaf-blades mostly 3–4 cm. long; plants very stout, very viscid throughout.

Involucral lobes broadly ovate to ovate-oblong, equaling or usually shorter than the tube.

Plants glabrous throughout, or with a few appressed hairs upon the involucre.

Plants conspicuously pubescent.

Pubescence scabrous, of very short conic hairs.

Pubescence chiefly of slender villous hairs, never of short conic hairs.

Stems villous nearly or quite throughout; blades of the lower leaves mostly rounded at the apex; perianth white or pinkish.

Stems villous only about the inflorescence if at all.

Perianth rose-colored or purplish-red; blades of the lower leaves obtuse or acutish at the apex, most of them narrowed to the apex and never rounded.

Perianth white or rarely pinkish; blades of the lower leaves usually all broadly rounded at the apex.

1. *H. Heimerlii*.

2. *H. oligantha*.

3. *H. polyphylla*.

4. *H. tenuiloba*.

5. *H. laevis*.

6. *H. cedrosensis*.

7. *H. Bigelovii*.

8. *H. californica*.

9. *H. retrorsa*.

#### 1. *Hesperonia Heimerlii* Standley, Contr. U. S. Nat. Herb. 13: 412. 1911.

Stems stout, the older ones white, much swollen at the nodes, much branched, the branches ascending or spreading, glabrous below, glandular-puberulent above, the internodes rather



long and the plants rather sparsely leafy; petioles stout, 3–15 mm. long; leaf-blades broadly deltoid-ovate to reniform-ovate, 1.5–3.5 cm. long, 1–3 cm. wide, obtuse to acutish at the apex, often apiculate, subcordate to truncate at the base, thick and fleshy, sparsely glandular-puberulent or scabrous, or in age glabrate, the blades of the upper leaves reduced, usually acute, short-petiolate; involucre numerous, short-pedunculate in the axils of the leaves or glomerate at the ends of the branches, 5–6 mm. long, densely viscid-puberulent, the lobes shorter than the tube, ovate, obtuse or acutish; perianth 10–12 mm. long, purplish-red, glandular-puberulent outside; stamens equaling the perianth; fruit globose or slightly depressed, 2.5–3 mm. long, dark-brown, obscurely rugulose.

TYPE LOCALITY: South end of Guadalupe Island, Lower California.

DISTRIBUTION: Guadalupe Island, Lower California.

2. *Hesperonia oligantha* Standley, Contr. U. S. Nat. Herb. 12: 363.  
1909.

Plants fruticose at the base, much branched, the branches slender, finely and sparsely puberulent or glabrate, the internodes 2.5–5 cm. long; petioles one third as long as the blades; leaf-blades deltoid-ovate, subcordate or rounded at the base, the lower ones rounded at the apex, the upper acute, sparsely puberulent; peduncles nearly as long as the involucre; involucre 9 mm. long, finely and densely viscid-puberulent, the lobes lance-triangular, acute, slightly longer than the tube; perianth about 12 mm. long; stamens long-exserted; fruit cylindric, acutish at both ends, 7–8 mm. long, almost 3 mm. thick, dark-brown, smooth.

TYPE LOCALITY: Calmalli, Lower California.

DISTRIBUTION: Known only from the type locality.

3. *Hesperonia polyphylla* Standley, Contr. U. S. Nat. Herb. 12: 364.  
1909.

Plants erect, suffrutescent at the base, about 5 dm. high, much branched, the branches slender or stout, glabrous below, glandular-puberulent above and sparsely villous; petioles slender or stout, 3–20 mm. long, the uppermost blades either long-petiolate or subsessile; leaf-blades orbicular-ovate to deltoid or narrowly ovate-deltoid, 1.5–3.5 cm. long, 1.2–3 cm. wide, subcordate to rounded at the base, acute to attenuate at the apex, the younger ones puberulent or short-villous, glabrate in age, thick and fleshy, the lateral veins often prominent; peduncles 2 mm. long or longer, sometimes equaling the involucre; involucre narrowly campanulate, 7–9 mm. long, densely short-villous and viscid, the lobes slightly unequal, usually exceeding the tube, lance-triangular, acute or attenuate; perianth 12–20 mm. long, the limb nearly as broad, glandular-puberulent outside, purplish-red; stamens included or slightly exserted; fruit oval in outline, 4 mm. long, 3 mm. thick, smooth, dark-brown, with 10 light-colored vertical lines.

TYPE LOCALITY: San Borge, Lower California.

DISTRIBUTION: Lower California and San Diego County, California.

4. *Hesperonia tenuiloba* (S. Wats.) Standley, Contr. U. S. Nat.  
Herb. 12: 363. 1909.

*Mirabilis tenuiloba* S. Wats. Proc. Am. Acad. 17: 375. 1882.

Plants erect, very stout, 3–6 dm. high, suffrutescent at the base, much branched, the branches very stout, whitish, densely short-villous or puberulent and viscid, the internodes mostly longer than the leaves, the nodes swollen; petioles stout, 2–7 mm. long, the upper blades subsessile; leaf-blades orbicular-deltoid, broadly deltoid-ovate, or rhombic-ovate, 2.5–4 cm. long, 1.3–3.5 cm. wide, subcordate or rounded at the base, acute or attenuate at the apex or the lower blades rarely obtuse, thick and fleshy, bright-green, densely viscid-puberulent, the upper leaves only slightly smaller than the lower; peduncles 2 mm. long or shorter, axillary, nearly concealed by the subtending leaves; involucre 10–13 mm. long, narrowly campanulate, densely short-villous and very viscid, the lobes slightly unequal, slightly exceeding the tube, narrowly lance-oblong, acute or attenuate; perianth 12–15 mm. long



(white ?), glandular-puberulent outside; stamens equaling the perianth; fruit oval in outline, 5 mm. long, 3.5 mm. in diameter, rounded at both ends, dark-brown, smooth.

TYPE LOCALITY: San Bernardino County, California.

DISTRIBUTION: In dry, sandy soil, Colorado Desert of southern California and northern Lower California.

### 5. *Hesperonia laevis* (Benth.) Standley, Contr. U. S. Nat. Herb.

12: 363. 1909.

*Oxybaphus laevis* Benth. Bot. Voy. Sulph. 44. 1844.

*Mirabilis laevis* Curran, Proc. Calif. Acad. II. 1: 235. 1889.

*Quamoclidion laeve* Rydb. Bull. Torrey Club 29: 687. 1902.

Plants erect, suffrutescent below, much branched, glabrous throughout, or a few minute appressed hairs present on the involucre, the branches slender, with long internodes, whitish; petioles of the lower leaves almost as long as the blades, the blades of the uppermost leaves subsessile; leaf-blades orbicular-ovate or deltoid-ovate, 1.5–3.5 cm. long, 1–2 cm. wide, subcordate at the base, acutish or subobtuse at the apex, slightly sinuate, succulent, inconspicuously veined; peduncles very short, few; involucre 10 mm. long, the lobes about equaling the tube, ovate, acute; perianth about 15 mm. long; stamens exerted.

TYPE LOCALITY: Magdalena Bay, Lower California.

DISTRIBUTION: Vicinity of the type locality.

### 6. *Hesperonia cedrosensis* Standley, Contr. U. S. Nat. Herb.

12: 362. 1912.

*Mirabilis cedrosensis* Jepson, Fl. Calif. 459. 1914.

Plants erect or ascending, 3–6 dm. high, suffrutescent or fruticose below, much branched, the branches slender, with long or short internodes, white or stramineous, glabrous below, scabrous above and sometimes viscid; petioles stout or slender, 3–13 mm. long, the uppermost blades subsessile; leaf-blades broadly deltoid, rhombic-ovate, or orbicular-ovate, 1.2–3 cm. long, 0.8–2.5 cm. wide, subcordate to rounded at the base, obtuse to acute at the apex, thick and succulent, scabrous with short conic retrorse hairs, or glabrate in age, the veins nearly obsolete, the blades of the upper leaves smaller, narrower, and more acute than those of the lower ones; peduncles few, 2 mm. long or wanting; involucre campanulate, 5–7 mm. long, densely covered with short viscid hairs, the lobes shorter than the tube, ovate or ovate-triangular, obtuse or acutish; perianth 12 mm. long, purplish-red, glabrous or sparsely puberulent; stamens about equaling the perianth; fruit subglobose but evidently longer than thick, 4.5–5 mm. long, smooth, dark-brown, with 10 light-colored vertical lines.

TYPE LOCALITY: Cedros Island, Lower California.

DISTRIBUTION: San Clemente Island, California; Cedros and San Benito islands and the western coast of Lower California.

### 7. *Hesperonia Bigelovii* (A. Gray) Standley.

*Mirabilis Bigelovii* A. Gray, Proc. Am. Acad. 21: 413. 1886.

*Mirabilis aspera* Greene, Erythraea 4: 67. 1896.

*Mirabilis californica aspera* Parish, Muhlenbergia 3: 125. 1907.

*Hesperonia aspera* Standley, Contr. U. S. Nat. Herb. 12: 362. 1909.

*Hesperonia aspera villosa* Standley, Contr. U. S. Nat. Herb. 12: 363. 1909.

*Hesperonia glutinosa gracilis* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Hesperonia limosa gracilis* Standley, Muhlenbergia 5: 104. 1909.

Plants erect or ascending, 3–6 dm. high, suffrutescent at the base, much branched, the branches usually stout, whitish, densely villous with slender whitish hairs and somewhat viscid, rarely glabrate below in age; petioles stout, 5–12 mm. long, or those of the upper leaves shorter; blades of the lower leaves reniform-ovate, broadly rhombic-ovate, or suborbicular, 2–4 cm. long, 1.3–3.7 cm. wide, broadly rounded at the apex, or rarely narrowed to an obtuse apex, subcordate to rounded at the base, the blades of the upper leaves smaller, broadly oblong-ovate to deltoid-ovate, often acute, all copiously villous with slender whitish hairs and slightly viscid, or glabrate in age, thick and succulent, the veins nearly obsolete; peduncles numerous, axillary and glomerate at the ends of the branches, 5 mm. long or shorter; involucre campanu-



late, 5–6 mm. long, densely villous or short-villous and viscid, the lobes shorter than the tube, oblong-ovate or broadly ovate, obtuse or acutish; perianth 8–12 mm. long, white or sometimes pinkish, sparsely short-villous and viscid outside; stamens slightly exerted or occasionally included; fruit subglobose but evidently longer than thick, 5 mm. long, dark-olive or greenish-brown, marked by 10 lighter vertical lines.

TYPE LOCALITY: Grand Canyon of the Colorado, below Peach Spring, Arizona.

DISTRIBUTION: In dry, mostly sandy soil, southern and western Arizona, and in southeastern California, from Inyo County to San Diego County.

### 8. *Hesperonia californica* (A. Gray) Standley, Contr. U. S. Nat.

Herb. 12: 364. 1909.

*Oxybaphus glabrifolius crassifolius* Choisy, in DC. Prodr. 13<sup>2</sup>: 431. 1849.

*Oxybaphus glabrifolius* Torr. Pacif. R. R. Rep. 4: 131. 1857. Not *O. glabrifolius* Vahl, 1806.

*Mirabilis californica* A. Gray, in Torr. Bot. Mex. Bound. Surv. 173. 1859.

*Oxybaphus californicus* Benth. & Hook. Gen. Pl. 3: 4. 1880.

*Hesperonia californica microphylla* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

Plants erect or decumbent, suffrutescent or fruticose below, much branched, the branches 2–10 dm. long, slender or stout, whitish, with short or elongate internodes, glabrous below, puberulent and viscid above and often villous but usually only sparsely so; petioles slender or stout, 12 mm. long or shorter, the uppermost blades often subsessile; blades of the lower leaves subreniform to rounded-ovate or deltoid-ovate, 1.5–4.5 cm. long, 1–3.5 cm. wide, cordate to truncate at the base, narrowed to the obtuse or acute apex, the blades of the upper leaves smaller, narrower, mostly acute or attenuate, all the blades green, thick and succulent, short-villous or puberulent and viscid when young, glabrate in age; peduncles numerous, often crowded at the ends of the branches, 3 mm. long or shorter; involucre campanulate, 5–8 mm. long, densely short-villous and viscid, the lobes shorter than the tube, ovate or ovate-oblong, obtuse or acutish; perianth 10–14 mm. long, purplish-red, sparsely short-villous outside; stamens equaling or slightly exceeding the perianth; fruit broadly oval in outline, 5 mm. long, smooth, dark-brown.

TYPE LOCALITY: Southern California.

DISTRIBUTION: California, from the Santa Lucia Mountains to San Diego County, chiefly near the coast, and on the adjacent islands; northern Lower California.

ILLUSTRATION: Bot. Mex. Bound. Surv. pl. 48.

### 9. *Hesperonia retrorsa* (Heller) Standley.

*Mirabilis glutinosa* A. Nelson, Proc. Biol. Soc. Wash. 17: 92. 1904. Not *M. glutinosa* Kuntze, 1898.

*Mirabilis retrorsa* Heller, Muhlenbergia 2: 193. 1906.

*Hesperonia glutinosa* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Hesperonia glutinosa retrorsa* Standley, Contr. U. S. Nat. Herb. 12: 365. 1909.

*Mirabilis limosa* A. Nelson, Bot. Gaz. 47: 426. 1909.

*Hesperonia limosa* Standley, Muhlenbergia 5: 104. 1909.

*Hesperonia limosa retrorsa* Standley, Muhlenbergia 5: 104. 1909.

*Mirabilis californica glutinosa* Jepson, Fl. Calif. 458. 1914.

*Mirabilis californica retrorsa* Jepson, Fl. Calif. 458. 1914.

Plants erect or ascending, suffrutescent at the base, much branched, the branches 3–6 dm. long, slender or stout, with usually elongate internodes, whitish, glabrous below, puberulent above with mostly retrorse hairs, usually slightly viscid and often sparsely short-villous; petioles stout, 5–12 mm. long, the uppermost blades often subsessile; blades of the lower leaves ovate-orbicular, broadly deltoid-ovate, or suborbicular, 1.5–3.5 cm. long, 1–3 cm. wide, often as broad as long, subcordate or rounded at the base, usually broadly rounded at the apex but rarely narrowed and acutish, the blades of the upper leaves slightly smaller and narrower, obtuse to acute at the apex, all the blades green, thick and succulent, inconspicuously veined, scaberulous or puberulent with mostly retrorse hairs, glabrate in age; peduncles numerous, axillary and crowded at the ends of the branches, those in the lower axils sometimes 14 mm. long, the upper ones much shorter, often nearly obsolete; involucre campanulate, 5–7 mm. long, densely viscid-puberulent or short-villous, the lobes shorter than the tube, ovate to ovate-oblong, obtuse or acutish; perianth 10–12 mm. long, white, sparsely viscid-puberulent outside or glabrate; stamens equaling the perianth or slightly exerted; fruit



broadly oval in outline, 5–6 mm. long, smooth, dark-olive or brown, usually with 10 lighter vertical lines.

**TYPE LOCALITY:** In Owen's Valley in the extreme southern part of Mono County, California, near the Southern Belle Mine.

**DISTRIBUTION:** In dry, chiefly sandy soil, southwestern Utah and western Arizona, and in south-eastern California, from Inyo County to San Diego County.

## 24. *MIRABILIS* L. Sp. Pl. 177. 1753.

*Jalapa* (Tourn.) Mill. Gard. Dict. Abr. ed. 4. 1754.

*Nyctago* Juss. Gen. Pl. 90. 1789.

*Trimista* Raf. Aut. Bot. 12. 1840.

*Admirabilis* (Clusius) Nieuwl. Am. Midl. Nat. 3: 280. 1914.

Perennial herbs, more or less pubescent, with dichotomous stems and tuberous roots. Leaves opposite, petiolate or sessile, the blades broad, entire. Inflorescence axillary or of terminal, dense or open cymes; involucre 1-flowered, campanulate, calyx-like, 5-lobed, the lobes erect, imbricate, only slightly accrescent in age; perianth corolla-like, colored, tubular or tubular-funnelform, the tube slender, elongate, constricted above the ovary, the limb 5-lobed, induplicate-plicate, often not broader than the tube. Stamens 3 or 5; filaments unequal, exserted, capillary, incurved, connate at the base into a short cup; anthers didymous. Ovary ellipsoid or obovoid; style filiform, exserted; stigma capitate, papillose. Anthocarp coriaceous, angled or costate, more or less constricted at both ends, often tuberculate or rugulose, glabrous or pubescent. Seed with the testa adherent to the pericarp; embryo uncinat, enclosing the farinaceous endosperm; radicle elongate, descending.

Type species, *Mirabilis Jalapa* L.

Perianth tubular, the limb scarcely if at all broader than the tube.

Stamens 3; fruit puberulent.

Stamens 5; fruit glabrous.

Perianth 4–5 cm. long, not conspicuously dilated below; plants very viscid; fruit obscurely angled.

Perianth 2.5–3 cm. long, conspicuously dilated below; plants only slightly viscid; fruit sharply angled.

Perianth expanded into a broad limb much wider than the tube.

Perianth 2–2.2 cm. long, gradually dilated from the base to the mouth, purplish-red.

Perianth 3–17 cm. long, abruptly dilated into the limb.

Perianth 3–5.5 cm. long, normally purplish-red.

Perianth 7–17 cm. long, white tinged with pink or purple.

Plants short-villous and very viscid, at least about the inflorescence; leaf-blades short-petiolate, the upper ones subsessile.

Plants puberulent, slightly or not at all viscid; leaf-blades, even the uppermost, conspicuously petiolate.

1. *M. Watsoniana*.

2. *M. exserta*.

3. *M. Pringlei*.

4. *M. Urbani*.

5. *M. Jalapa*.

6. *M. longiflora*.

7. *M. Wrightiana*.

### 1. *Mirabilis Watsoniana* Heimerl, Bot. Jahrb. 11: 84. 1889.

Plants erect, much branched, densely leafy, the branches puberulent above, glabrate below; lower leaves long-petiolate, the uppermost subsessile, the blades ovate-deltoid, cordate or truncate at the base and short-decurrent, acute or acuminate at the apex, thin, green, glabrous, ciliate; peduncles slender, short-villous, cymosely glomerate at the ends of the branches, tubular-campanulate, unequally 5-lobed, short-villous, slightly accrescent in age; perianth tubular, short-villous below, gradually dilated upward, the limb scarcely broader than the tube, 5-lobed; stamens 5, subequal, long-exserted; fruit small, obovoid-pyramidal, dark-brown, constricted at both ends, 5-angled, the angles subtuberculate, the sides smooth, puberulent, slightly viscid when moistened.

**TYPE LOCALITY:** Cuesta de Sololá, Guatemala.

**DISTRIBUTION:** Known only from the type locality.

**ILLUSTRATION:** Bot. Jahrb. 11: pl. 2, f. 2a–2h.

### 2. *Mirabilis exserta* Brand. Proc. Calif. Acad. II. 3: 165. 1891.

Plants erect, 4–6 dm. high, much branched, the branches slender, densely viscid-puberulent, or glabrate below; petioles slender, 1–2.5 cm. long; leaf-blades rhombic-orbicular, ovate-orbicular, broadly ovate-deltoid, or oval-ovate, 6–11 cm. long, 4–10.5 cm. wide, subcordate



or truncate at the base, attenuate to broadly rounded at the apex, often apiculate, thin, bright-green, sparsely puberulent when young but soon glabrate, minutely ciliolate; inflorescence of large terminal many-flowered cymes, these bearing few small, orbicular or ovate bracts; peduncles 1–5 mm. long, densely short-villous and viscid; involucre broadly turbinate-campanulate, 6–11 mm. long, densely viscid-villous, the lobes shorter than the tube, broadly triangular, acute, slightly accrescent in age; perianth 4–5 cm. long, white tinged with pink, sparsely glandular-villous outside with short hairs, gradually dilated upward, the limb 1.5–2.5 cm. broad; stamens 5, about twice as long as the perianth; fruit broadly obovoid or oval, 6–8 mm. long, obscurely angled, smooth, dark-brown.

TYPE LOCALITY: Summits of the spurs of the Sierra de San Francisquito, Lower California.

DISTRIBUTION: Mountains of the Cape Region of Lower California.

### 3. *Mirabilis Pringlei* Weatherby, Proc. Am. Acad. 45: 424. 1910.

Plants erect, about 1 meter high, much branched, the branches slender, finely viscid-puberulent; petioles slender, 3–15 mm. long; leaf-blades suborbicular to rounded-deltoid or deltoid-ovate, 3.5–10 cm. long, 2–9 cm. wide, unequally subcordate at the base, acute to attenuate at the apex, thin, bright-green, glabrous, ciliolate; inflorescence of terminal many-flowered cymes, bracteate, the bracts minute; peduncles 1–6 mm. long, densely short-villous; involucre campanulate, 5–8 mm. long, glandular-puberulent, the lobes as long as the tube, oval-ovate, acute or obtuse; perianth tubular, 2.5–3 cm. long, sparsely glandular-puberulent, white tinged with pink, 4–5 mm. in diameter, slightly dilated below, the shallowly 5-lobed limb scarcely broader than the tube; stamens 5, the filaments nearly twice as long as the perianth, much coiled and twisted; fruit broadly obovoid, 6–7 mm. long, 4–5 mm. in diameter, constricted at both ends, sharply 5-angled, slightly tuberculate, dark-brown, glabrous.

TYPE LOCALITY: Under limestone cliffs, Iguala Canyon, Guerrero, at an altitude of 915 meters.

DISTRIBUTION: Known only from the type locality.

### 4. *Mirabilis Urbani* Heimerl, Oesterr. Bot. Zeits. 56: 250. 1906.

Plants erect, much branched, the branches slender, puberulent above, glabrate below; petioles 1.5 cm. long or shorter, the uppermost blades subsessile; leaf-blades ovate-deltoid, 4.5 cm. long and 3 cm. wide or smaller, subtruncate and short-decurrent at the base, acute or attenuate at the apex, thin, green, puberulent, ciliolate; involucres solitary in the axils and aggregate in small cymes at the ends of the branches, campanulate, 7 mm. long, glabrate, the lobes about as long as the tube, lance-oblong, subobtuse, ciliate, the peduncles 3–4 mm. long, short-villous; perianth purplish-red, 2–2.2 cm. long, short-villous below, gradually dilated from the base to the 5-lobed limb, this 12–14 mm. broad; stamens 5, exserted; fruit 6–7 mm. long, oblong-ellipsoid, 5-angled, puberulent.

TYPE LOCALITY: San Salvador, Michoacán or Guerrero.

DISTRIBUTION: Michoacán and Guerrero.

### 5. *Mirabilis Jalapa* L. Sp. Pl. 177. 1753.

*Mirabilis odorata* L. Cent. Pl. 1: 7. 1755.

*Mirabilis dichotoma* L. Sp. Pl. ed. 2. 252. 1762.

*Jalapa dichotoma* Crantz, Inst. 2: 266. 1766.

*Jalapa congesta* Moench, Meth. 508. 1794.

*Nyctago versicolor* Salisb. Prodr. 57. 1796.

*Jalapa undulata* Moench, Meth. Suppl. 196. 1802.

*Nyctago Jalapae* DC. Fl. Fr. 3: 426. 1805.

*Nyctago mirabilis* Jaume St.-Hil. Expos. Fam. 1: 212. 1805.

*Mirabilis pedunculata* Stokes, Bot. Mat. Med. 1: 311. 1812.

*Mirabilis divaricata* Lowe, Trans. Cambridge Phil. Soc. 17. 1831.

*Mirabilis procera* Bertol. Novi Comm. Bonon. 3: 15. 1839.

*Mirabilis planiflora* Trautv. Bull. Acad. Sci. St.-Petersb. 6: 216. 1840.

*Trimista levigata* Raf. Aut. Bot. 12. 1840.

*Mirabilis ambigua* Trautv. Linnaea 15: Lit. Ber. 97. 1841.

*Mirabilis Jalapa procera* Choisy, in DC. Prodr. 13<sup>2</sup>: 428. 1849.

*Mirabilis Jalapa ambigua* Choisy, in DC. Prodr. 13<sup>2</sup>: 428. 1849.

*Mirabilis Jalapa planiflora* Choisy, in DC. Prodr. 13<sup>2</sup>: 428. 1849.

*Mirabilis Jalapa odorata* Heimerl, Bot. Jahrb. 21: 616. 1896.

*Mirabilis Jalapa volcanica* Standley, Contr. U. S. Nat. Herb. 12: 367. 1909.

*Mirabilis Jalapa gracilis* Standley, Contr. U. S. Nat. Herb. 12: 367. 1909.



*Mirabilis Jalapa Lindheimeri* Standley, Contr. U. S. Nat. Herb. 12: 368. 1909.

*Mirabilis Jalapa ciliata* Standley, Contr. U. S. Nat. Herb. 12: 368. 1909.

*Admirabilis peruana* Nieuwl. Am. Midl. Nat. 3: 280. 1914.

Erect perennial, 4–10 dm. high, from a thick woody or fleshy root, much branched, the branches erect or ascending, slender or stout, glabrous, puberulent, or rarely short-villous, often viscid; petioles slender, 0.3–5 cm. long, the uppermost blades on very short petioles; leaf-blades ovate-deltoid, broadly ovate, ovate-oblong, or rarely lance-ovate, 4–14 cm. long, 2–8.5 cm. wide, subcordate to rounded at the base, short-decurrent, acute to attenuate at the apex, often abruptly so, rarely obtuse, thin, bright-green, glabrous or rarely puberulent, usually ciliolate; peduncles 1–2 mm. long or rarely longer, or wanting, cymosely glomerate at the ends of the branches, the inflorescence bearing numerous reduced leaves; involucre campanulate, 7–15 mm. long, glabrous, puberulent, or short-villous, the lobes longer than the tube, linear-lanceolate to lance-ovate, acute to attenuate, usually ciliolate; perianth 3–5.5 cm. long, purplish-red (in cultivation often white, yellow, or variegated), glabrous or sparsely villous outside, the tube 2–5 mm. thick, gradually dilated upward, the limb 2–3.5 cm. broad, shallowly 5-lobed, the lobes broadly rounded; stamens 5, equaling or slightly exceeding the perianth; fruit obovoid or oval, 7–9 mm. long, 5-angled, verrucose or rugose, dark-brown or black, glabrous or puberulent.

TYPE LOCALITY: Described from cultivated plants.

DISTRIBUTION: Western Texas, Mexico, Central America, and southward through tropical South America; general in the West Indies but probably naturalized; adventive in Florida and along the Gulf Coast of the United States and rarely escaping from cultivation elsewhere; widely cultivated and now naturalized through the tropical regions of the Old World.

ILLUSTRATIONS: Edwards, New Bot. Gard. 1: *pl.* 36. *f.* 1; Bot. Mag. *pl.* 371; Lam. Tab. Encyc. *pl.* 105; Mart. Fl. Bras. 14<sup>2</sup>: *pl.* 81; Nicholson, Dict. Gard. 2: *f.* 580; Descourt. Fl. Ant. 2: *pl.* 139; Schkuhr, Ench. *pl.* 41; Gaertn. Fruct. *pl.* 127; Rheed. Hort. Malab. *pl.* 75; Rumph. Hort. Amboin. *pl.* 89; Spach, Hist. Vég. *pl.* 146; Fawc. & Rendle, Fl. Jam. 3: *f.* 49.

## 6. *Mirabilis longiflora* L. Sv. Vet.-Akad. Handl. 1755: 176. 1755.

*Jalapa longiflora* Moench, Meth. 508. 1794.

*Nyctago longiflora* Salish. Prodr. 57. 1796.

*Mirabilis suaveolens* H. B. K. Nov. Gen. & Sp. 2: 213. 1817.

Plants erect, 5–15 dm. high, much branched, the branches erect or ascending, slender, densely viscid-puberulent or short-villous, the internodes usually longer than the leaves; petioles slender, usually less than 1 cm. long but rarely 4.5 cm. long in the lowest leaves, the upper leaves sessile or subsessile; leaf-blades cordate-ovate to narrowly deltoid-ovate or lance-ovate, 6–11.5 cm. long, 3–7 cm. wide, cordate at the base, acute to long-attenuate at the apex, usually subabruptly so, thin, bright-green, densely viscid-puberulent or rarely glabrate; inflorescence of numerous dense, axillary or terminal, leafy glomerules, these sometimes subtended by long linear bractlike leaves; involucres on peduncles 3 mm. long or usually shorter, campanulate, 1–1.5 cm. long, densely glandular-villous with short hairs, the lobes slightly unequal, equaling or exceeding the tube, triangular to narrowly triangular-lanceolate, very acute to long-attenuate; perianth 7–17 cm. long, densely viscid-villous outside, white tinged with pink or purplish-red, the tube very slender, about 2 mm. in diameter, abruptly expanded into a shallowly 5-lobed limb 2–3 cm. broad; stamens 5, exerted 2.5 cm. or less; fruit oblong, ellipsoid, 8 mm. long, 5 mm. in diameter, constricted at both ends, obtusely 5-angled, tuberculate, densely puberulent between the tubercles.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Western Texas to southern Arizona, southward to Veracruz and Oaxaca.

ILLUSTRATIONS: Smith, Exot. Bot. 1: *pl.* 23; Sv. Vet.-Akad. Handl. 1755: *pl.* 6, *f.* 1; Nees, Pl. Med. Suppl. *pl.* 33; Gaertn. Fruct. *pl.* 127; Agardh, Syst. *pl.* 26.

## 7. *Mirabilis Wrightiana* A. Gray; Britton & Kearney, Trans. N. Y.

Acad. 14: 28. 1894.

Plants erect, 6–12 dm. high, much branched, the branches erect or ascending, slender, minutely puberulent and scarcely or not at all viscid, glabrate below; petioles slender, 1–6 cm. long, the uppermost blades usually short-petiolate, very rarely subsessile; leaf-blades broadly cordate-ovate to narrowly ovate-deltoid, 5–12.5 cm. long, 2–8 cm. wide, cordate to truncate at the base and often short-decurrent, rather abruptly acute to long-attenuate at the



apex, thin, bright-green, minutely puberulent or in age glabrate, minutely ciliolate; inflorescence of numerous dense terminal headlike cymes, these subtended by leaves or narrow bracts, the peduncles 3 mm. long or usually shorter; involucre campanulate, 1–1.5 cm. long, densely puberulent, slightly if at all viscid, the lobes about as long as the tube, narrowly to broadly triangular, very acute to long-attenuate; perianth white tinged with pink or purple, 10–14 cm. long, sparsely and minutely puberulent outside, the tube very slender, 2 mm. in diameter, abruptly expanded into a shallowly 5-lobed limb 2.5–3 cm. broad; stamens 5, exserted 3 cm. or less; fruit oblong-ellipsoid, 8 mm. long, 5 mm. in diameter, constricted at both ends, dark-brown, obtusely tuberculate, puberulent.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Arizona to western Texas, Coahuila, and Sonora.

#### DOUBTFUL SPECIES

MIRABILIS HYBRIDA Lepel. Ann. Mus. Paris 8: 481. 1806. (*Mirabilis cordata* Brouss.; R. & S. Syst. Veg. 4: 2. 1819.) A form described from cultivated material, thought to be a hybrid between *M. Jalapa* and *M. longiflora*. It has been stated that the plant is found in the natural state, but no such specimens have been seen by the writer.

MIRABILIS OAXACAE Heimerl (Sitz.-ber. Akad. Wiss. Wien 93: 234, hyponym. 1886) Beitr. Syst. Nyct. 20. 1897. Said to be "a subspecies or variety with the flowers long-tubular, the limb of the perianth narrow, the involucres short, the fruit more oblong (than in *M. Jalapa*) \* \* \* collected by Franco about Oaxaca in southern Mexico."

VI. **ABRONIEAE.** Herbs. Leaves opposite. Flowers perfect, capitate, the head surrounded by an involucre of distinct bracts; perianth corolla-like, the free portion withering and persistent or deciduous, the lobes induplicate-valvate. Stigma linear. Anthocarp coriaceous, eglandular. Embryo curved, the inner cotyledon abortive.

### 25. **TRIPTEROCALYX** (Torr.) Hook. Jour. Bot. & Kew Misc. 5: 261. 1853.

*Abronia* § *Tripterocalyx* Torr. in Frém. Rep. 92. 1843.

*Cycloptera* Nutt.; A. Gray, Am. Jour. Sci. II. 15: 319, as synonym. 1853. Not *Cycloptera* Endl. 1841.

*Apaloptera* Nutt.; A. Gray, Am. Jour. Sci. II. 15: 319, as synonym. 1853

*Tripteridium* Torr.; Britt. & Brown, Ill. Fl. ed. 2. 2: 33, as synonym. 1913.

Succulent annual herbs, erect, decumbent, or procumbent, branched, more or less pubescent. Leaves opposite, those of a pair unequal, long-petiolate, the blades broad, entire or slightly sinuate. Flowers perfect, capitate, the heads many-flowered, surrounded by an involucre of numerous distinct thin bracts, the bracts unchanged after anthesis; perianth corolla-like, tubular-funnelform, the tube slender, elongate, constricted above the ovary, the limb narrow, 4- or rarely 5-lobed, the lobes obovate or obcordate, emarginate or bilobate, induplicate-plicate. Stamens 4 or rarely 5; filaments capillary, unequal, connate at the base, united above with the perianth-tube; anthers linear-oblong, included. Ovary ovoid; style filiform; stigma fusiform, included. Anthocarp fusiform, with 2–4 broad thin reticulate-veined vertical wings, these completely encircling the body and extended above and below it, the body coriaceous, spongy, or indurate, often costate between the wings. Seed with a thin testa adherent to the pericarp; one of the cotyledons broad and enclosing the farinaceous endosperm, the other obsolete; radicle slender, elongate, descending.

Type species, *Abronia micrantha* Torr.

Body of the fruit sparsely villous, coarsely transverse-costate, the veins of the 2 wings much thickened; bracts 6–10 mm. long; perianth 2–2.5 cm. long.

Body of the fruit glabrous or sparsely puberulent, longitudinally costate or obscurely transverse-veined, the veins of the 3 or rarely 4 wings slender.

Perianth about 1.5 cm. long, the limb greenish.

Body of the fruit longitudinally costate; peduncles elongate, often longer than the subtending leaves; perianth glabrous or obscurely puberulent.

1. *T. Crux-Maltae*.

2. *T. pedunculatus*.



- Body of the fruit not costate; peduncles short, always shorter than the subtending leaves; perianth densely glandular-puberulent. 3. *T. micranthus*.  
 Perianth 2.5–3.5 cm. long, the limb white or pink.  
 Fruit 1.5–2 cm. long; perianth-limb white, pink outside; stems rather densely pubescent with short slender hairs; bracts narrowly lanceolate. 4. *T. Wootonii*.  
 Fruit 2–3.5 cm. long; perianth-limb pink; stems sparsely pubescent with short, conic or very stout hairs; bracts ovate or lance-ovate. 5. *T. cyclopterus*.

1. ***Tripterocalyx Crux-Maltae* (Kellogg) Standley, Contr. U. S. Nat. Herb. 12: 328. 1909.**

*Abronia Crux-Maltae* Kellogg, Proc. Calif. Acad. 2: 71. 1863.

Plants ascending or procumbent, much branched, the branches stout, 1–3 dm. long, viscid-villous with very slender long white hairs or glabrate; petioles 1–4 cm. long; leaf-blades elliptic-oblong, ovate-oblong, broadly ovate, or ovate-rhombic, 2–5 cm. long, 2–3 cm. wide, acute to rounded at the base and often unequal, narrowed to an obtuse apex, bright-green, viscid-puberulent when young but soon glabrate; peduncles 1–6 cm. long; bracts ovate or lanceolate, 6–10 mm. long, attenuate or long-attenuate, densely viscid-villous; perianth 2–2.5 cm. long, densely long-villous outside or rarely only puberulent, the limb about 1 cm. broad, deeply lobed, bright purplish-pink with a green throat, the lobes deeply bilobate; fruit 1–1.5 cm. long, orbicular or broader than long, the body coarsely transverse-rugose, villous, the 2 wings thin, very coarsely reticulate-veined, the veins indurate, puberulent or villous, the margins ciliolate.

TYPE LOCALITY: Carson Valley, Nevada.

DISTRIBUTION: Western Nevada and adjacent California.

ILLUSTRATION: Proc. Calif. Acad. 2: f. 16.

2. ***Tripterocalyx pedunculatus* (M. E. Jones) Standley, Contr. U. S. Nat. Herb. 12: 328. 1909.**

*Abronia micrantha pedunculata* M. E. Jones, Proc. Calif. Acad. II. 5: 716. 1895.

*Abronia pedunculata* Rydb. Bull. Torrey Club 29: 686. 1902.

Plants erect or decumbent, 2–3 dm. high, much branched, the branches stout, glabrous or minutely viscid-puberulent; petioles 1–4.5 cm. long; leaf-blades ovate-oblong, lance-oblong, or broadly ovate, 2.5–4.5 cm. long, 1.2–2.5 cm. wide, rounded to broadly cuneate at the base and unequal, obtuse or acutish at the apex, scaberulous when young but soon glabrate, green above, glaucescent beneath; peduncles 1.5–5.5 cm. long, often longer than the subtending leaves; bracts lanceolate or ovate, long-attenuate, 5–10 mm. long, glabrous, obscurely ciliolate; perianth 1.5 cm. long, glabrous outside or obscurely puberulent, the limb 4 mm. wide, greenish-white; fruit 2–2.5 cm. long, rounded or emarginate at the apex, the body 1–3-costate between each pair of wings, obscurely viscid-puberulent when young but soon glabrate, the wings thin, scaberulous on the margins, with conspicuous slender reticulate veins; seed oblong-cylindric, 6–7 mm. long, rounded at the apex, acute at the base, brown.

TYPE LOCALITY: St. George, Utah, at an altitude of 810 meters, in red sand.

DISTRIBUTION: Central Utah to northwestern Arizona.

The fruit of this plant resembles that of *T. Wootonii* and the flowers those of *T. micranthus*. Possibly it is a hybrid between those two species.

3. ***Tripterocalyx micranthus* (Torr.) Hook. Jour. Bot. & Kew Misc. 5: 261. 1853.\***

*Abronia micrantha* Torr. in Frém. Rep. 92. 1843.

*Cycloptera annua* Nutt.; A. Gray, Am. Jour. Sci. II. 15: 319, as synonym. 1853.

*Apaloptera annua* Nutt.; A. Gray, Am. Jour. Sci. II. 15: 319, as synonym. 1853.

*Tripteridium micranthum* Torr.; Britt. & Brown, Ill. Fl. ed. 2. 2: 33, as synonym. 1913.

Plants much branched, the branches stout, 2–5 dm. long, ascending or procumbent, glaucescent, scabrous or viscid-puberulent with short stout hairs, finally glabrate; petioles 1–5 cm. long; leaf-blades lance-oblong, oblong, ovate-oblong, ovate, or rhombic-ovate, 2.5–6 cm. long, 1–3 cm. wide, broadly cuneate to truncate at the base, narrowed to an obtuse or rarely rounded apex, green above, glaucous or glaucescent beneath, scaberulous when young but soon glabrate, scaberulo-ciliolate; peduncles 1–2.5 cm. long, much shorter than the sub-

\* By typographical error the specific name was given by Hooker as *macranthus*.



tending leaves; bracts lanceolate or lance-ovate, 6–10 mm. long, long-attenuate, glabrous or viscid-puberulent, ciliate; perianth about 1.5 cm. long, viscid-puberulent outside, the limb 3–4 mm. broad, greenish-white; fruit 1.5–3 cm. long, usually 3-winged, retuse or rounded at the apex, the body very thick, loosely spongy, coarsely rugose or nearly smooth, glabrous or obscurely puberulent, the wings thin, finely veined, scaberulo-ciliolate; seed narrowly oblong, 6–8 mm. long, obtusely 3-angulate, brown.

TYPE LOCALITY: Near the mouth of the Sweetwater River [Natrona County, Wyoming].

DISTRIBUTION: In sandy soil, western Kansas to North Dakota, Montana, Nevada, and northern New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 1423; ed. 2. f. 1732; Clements, Rocky Mt. Fl. pl. 9, f. 16.

4. ***Tripterocalyx Wootonii* Standley, Contr. U. S. Nat. Herb. 12: 329. 1909.**

Plants ascending or decumbent, 2–5 dm. high, much branched, the branches stout, pale-green, densely pubescent with short slender viscid hairs when young, glabrate in age; petioles 1.5–5.5 cm. long; leaf-blades narrowly deltoid-oblong to oblong-ovate, oblong, broadly ovate, or rhombic-ovate, 2.5–6.5 cm. long, 0.8–3 cm. wide, rounded to broadly cuneate at the base, narrowed to an obtuse, rounded, or rarely acute apex, bright-green above, glaucous or glaucescent beneath, when young pubescent with short slender viscid hairs, glabrate in age; peduncles 3–15 cm. long; bracts linear-lanceolate, 11–18 mm. long, long-attenuate, viscid-villous with short hairs; perianth 2.5–3.2 cm. long, viscid-puberulent outside, the limb 8–10 mm. broad, white inside, pale-pink outside, the lobes emarginate; fruit 1.5–2 cm. long, usually 3-winged, rounded at both ends, the body hard and rigid, 1–3-costate between each pair of wings, sparsely puberulent or glabrous, the wings thin, finely reticulate-veined, scaberulo-ciliolate; seed narrowly oblong, 7–8 mm. long, 2 mm. in diameter, rounded at the apex, acute at the base, pale-brown.

TYPE LOCALITY: Near Ojo Caliente, Zuni Reservation, New Mexico.

DISTRIBUTION: In dry, sandy soil, northwestern New Mexico and northern Arizona; probably also in adjacent Utah and Colorado.

5. ***Tripterocalyx cyclopterus* (A. Gray) Standley, Contr. U. S. Nat. Herb. 12: 329. 1909.**

*Abronia cycloptera* A. Gray, Am. Jour. Sci. II. 15: 319, excluding synonyms. 1853.

*Abronia carnea* Greene, Pittonia 3: 343. 1898.

Plants erect or decumbent, 3–6 dm. high, much branched, the branches very stout, sparsely scabrous with short conic hairs or glabrate; petioles 2.5–5 cm. long; leaf-blades oblong to lance-oblong, ovate-oblong, or narrowly ovate, 4–7.5 cm. long, 1.5–3.5 cm. wide, truncate to obtuse at the base and usually unequal, acute to obtuse at the apex, sometimes apiculate, bright-green above, glaucous or glaucescent beneath, scabrous beneath when young, glabrate in age; peduncles 3–11 cm. long; bracts ovate, lance-ovate, or oval, 12–22 mm. long, rather abruptly long-attenuate, very thin, usually glabrous, ciliate; perianth 3–3.5 cm. long, viscid-puberulent or short-villous outside, bright-pink, the limb 8–13 mm. broad, the lobes deeply bilobate; fruit 2–3.5 cm. long, usually 3-winged, the body hard and rigid, 3-costate between each pair of wings, glabrous or obscurely puberulent, the wings thin, finely reticulate-veined, scaberulo-ciliolate, the terminal flower of each head rarely producing an elliptic-fusiform exalate fruit; seed narrowly oblong, 8–9 mm. long, rounded at the apex, acute at the base, pale-brown.

TYPE LOCALITY: Along the Rio Grande, southern New Mexico.

DISTRIBUTION: In dry, sandy soil, western Texas, southern New Mexico, and northern Chihuahua.

26. **ABRONIA** Juss. (Gen. 448, hyponym. 1789); Lam. Tab. Encyc. 1: 469. 1791.

*Tricratus* L'Hér.; Willd. Sp. Pl. 1: 807. 1799.

Annual or perennial herbs with branched stems, sometimes caespitose and apparently acaulescent, more or less pubescent with viscid hairs. Leaves opposite, petiolate, those of a



pair usually very unequal, the blades succulent, entire or sinuate-lobed. Flowers perfect, capitate, few or many in each head, the heads long-pedunculate, each subtended by usually 5 distinct scarious bracts; perianth funnellform, the tube slender, elongate, constricted above the ovary, the limb 5-lobate, the lobes induplicate-plicate, bilobate, the perianth withering and often persistent after anthesis. Stamens usually 5; filaments capillary, unequal, connate at the base, above adnate to the perianth-tube; anthers linear-oblong, included. Ovary ovoid; style filiform, the stigma fusiform, included. Anthocarp turbinate or biturbinate, coriaceous or indurate, eglandular, deeply lobed or winged, the wings or lobes 2-5. Seed adherent by the testa to the pericarp; one of the cotyledons broad, concave, enclosing the farinaceous endosperm, the other abortive; radicle exterior, elongate, descending.

Type species, *Abronia umbellata* Lam.

Perianth yellow.	I. <i>Latifoliae</i> .
Perianth white, pink, or purplish-red.	
Fruits, at least most of them, winged.	III. <i>Umbellatae</i> .
Fruits not winged, usually deeply lobed, the lobes often compressed and winglike, but the central cavity extending quite to their edges.	
Plants acaulescent or nearly so, perennial, caespitose, with branched caudices.	IV. <i>Nanae</i> .
Plants with elongate stems, annuals or perennials, never caespitose.	
Perianth deep dark-red; prostrate seacoast perennials.	II. <i>Maritimae</i> .
Perianth white, pink, or purplish-red.	
Flowers 3 or 4 in each head; fruits not lobed; perianth purplish-red.	III. <i>Umbellatae</i> .
Flowers numerous in each head; most of the fruits deeply lobed.	
Plants perennial; perianth white, or abnormally purplish-red in one species; bracts usually large and broad.	V. <i>Fragrantes</i> .
Plants annual; perianth usually purplish-red, sometimes white inside but always reddish outside; bracts small and narrow, lanceolate or lance-linear.	VI. <i>Turbinatae</i> .
I. LATIFOLIAE	
A single species.	1. <i>A. latifolia</i> .
II. MARITIMAE	
A single species.	2. <i>A. maritima</i> .
III. UMBELLATAE	
Fruits all exalate; flowers 3 or 4 in each head.	3. <i>A. alpina</i> .
Fruits all or mostly winged; flowers numerous in each head.	4. <i>A. pogonantha</i> .
Wings of the fruit 2; bracts broadly ovate or orbicular-ovate.	
Wings of the fruit usually 3-5; bracts commonly lance-ovate to narrowly lanceolate.	
Perianth about 12 mm. long.	
Wings of the fruit broad, widest above, prolonged above the body of the fruit and acute.	7. <i>A. acutalata</i> .
Wings of the fruit narrow, widest at the middle, narrowed upward and not prolonged above the body of the fruit.	8. <i>A. breviflora</i> .
Perianth 15 mm. long or longer.	
Limb of the perianth white; erect or procumbent perennial of the interior plains and hillsides.	13. <i>A. mellifera</i> .
Limb of the perianth purplish-red, or abnormally white in some prostrate seashore plants.	
Perianth-tube 16-20 mm. long; stems densely villous; annual plant of interior plains and hillsides.	5. <i>A. pinetorum</i> .
Perianth-tube 10-14 mm. long.	
Stem and perianth densely long-villous; body of the fruit strongly rugose-veined, the coarse veins extending into the wings; plant of interior plains and foothills.	6. <i>A. villosa</i> .
Stem and perianth glabrous, puberulent, or sparsely short-villous; body of the fruit not rugose-veined; plants of seashores.	
Wings of the fruit indurate and woody.	9. <i>A. alba</i> .
Wings of the fruit thin and soft.	
Wings of the fruit truncate or narrowed above, not prolonged above the body, the whole fruit usually longer than broad; leaf-blades entire or nearly so; stems viscid-puberulent or glabrate.	10. <i>A. umbellata</i> .
Wings of the fruit rounded or acutish at the apex, prolonged above the body, the fruit often broader than long.	
Stems copiously villous; leaf-blades sinuate-lobed or undulate; bracts ovate or lance-ovate.	11. <i>A. gracilis</i> .



Stems viscid-puberulent or glabrate; leaf-blades usually entire; bracts lanceolate or linear-lanceolate.

12. *A. minor*.

#### IV. NANAE

Bracts lanceolate or narrowly oblong, 2 mm. wide; leaf-blades suborbicular to ovate.

14. *A. Covillei*.

Bracts oval to oblong, 3.5–7 mm. wide.

Leaf-blades suborbicular to oblong-elliptic, 5–14 mm. wide.

15. *A. nana*.

Leaf-blades linear to linear-ob lanceolate, 3.5–4 mm. wide.

16. *A. Bigelovii*.

#### V. FRAGRANTES

Stems copiously villous or short-villous, at least above.

Fruit whitish-stramineous, turbinate, often as broad as long, the winglike lobes dilated at the apex and flat-topped.

17. *A. salsa*.

Fruit dark-olivaceous or brownish, usually biturbinate and much longer than broad, the lobes compressed and thin-edged throughout.

18. *A. fragrans*.

Stems puberulent or glabrous.

Bracts rounded or very obtuse at the apex, 10–12 mm. long, 5–7 mm. wide. Perianth 18–22 mm. long; leaf-blades usually oval to ovate-oblong, longer than wide.

19. *A. elliptica*.

Perianth 12–14 mm. long; leaf-blades, even those of the upper leaves, orbicular or nearly so.

20. *A. orbiculata*.

Bracts acute to attenuate.

Stems glabrous or nearly so; bracts 11–15 mm. long; fruit 7–10 mm. long, biturbinate.

21. *A. glaucescens*.

Stems copiously viscid-puberulent; bracts 4–10 mm. long; fruit less than 7 mm. long.

Perianth about 12 mm. long; bracts 4–5 mm. long, elliptic-oblong or lance-ovate.

22. *A. ammophila*.

Perianth 13–20 mm. long; bracts 5–10 mm. long.

Bracts linear-lanceolate or narrowly oval, usually 2–3 mm. wide; leaf-blades mostly subcordate at the base; fruit biturbinate, 6–8 mm. long.

23. *A. texana*.

Bracts oval or broadly ovate, usually 4–5 mm. wide; leaf-blades very acute to rounded at the base; fruit about 5 mm. long.

Fruit turbinate, the lobes flat-topped; leaf-blades mostly oblong or ovate-oblong, 0.7–2.5 cm. wide.

24. *A. pumila*.

Fruit biturbinate, the lobes compressed above; leaf-blades lance-elliptic or lanceolate, 0.4–1 cm. wide.

25. *A. Carletoni*.

#### VI. TURBINATAE

Bracts 6–12 mm. long, lanceolate or lance-linear, very acute or attenuate; perianth purplish-red; blades of the leaves usually much longer than broad.

26. *A. angustifolia*.

Bracts 5–7 mm. long, obtuse to very acute; perianth white within, reddish outside; blades of the lower leaves mostly as broad as long.

Fruit deeply lobed, the lobes compressed and acute; bracts linear-lanceolate or lance-oblong, very acute or attenuate.

27. *A. turbinata*.

Fruit shallowly lobed, the lobes with obtuse edges; bracts ovate or oval, obtuse or acutish.

28. *A. exalata*.

I. *Latifoliae*. Prostrate perennials of seashores, with thick fleshy roots. Leaf-blades mostly orbicular. Bracts ovate or oval, small. Perianth yellow. Fruit thick-coriaceous, deeply lobed, the lobes winglike.

#### 1. *Abronia latifolia* Eschsch. Mém. Acad. St.-Pétersb. 5: 271. 1826.

*Abronia arenaria* Menzies; Hook. Exot. Fl. pl. 193. 1827.

*Tricratus arenarius* Spreng. Syst. Cur. Post. 53. 1827.

Perennial, from an elongate fleshy root, this 2–10 cm. in diameter and often 30 cm. long or longer; stems very stout, 3–10 dm. long, sparingly branched, prostrate, densely glandular-puberulent, the internodes mostly longer than the leaves; petioles stout, 1–6 cm. long, viscid-puberulent; leaf-blades orbicular to oval, rounded-deltoid, or reniform, 1.5–4 cm. long, 1–4 cm. wide, obtuse to subcordate at the base, sometimes short-decurrent, broadly rounded at the apex, thick and succulent, sparsely or densely and minutely viscid-puberulent, or sometimes glabrate; peduncles stout or slender, 2–10 cm. long, viscid-puberulent or viscid-villous; bracts 5, broadly ovate or ovate-oval, 5–7 mm. long, 3–4 mm. wide, obtuse or acute, scarious, viscid-puberulent or short-villous; flowers numerous, the perianth 13–15 mm. long, the tube slender, short-villous or viscid-puberulent, greenish-yellow, the limb 5–8 mm. broad, yellow; fruit biturbinate, 8–15 mm. long, deeply 5-lobed, coriaceous, puberulent, 1-costate in the angles,



the lobes compressed, winglike, transverse-veined, attenuate upward or subtruncate; seed elliptic-oblong, 4–5 mm. long, brown.

TYPE LOCALITY: California.

DISTRIBUTION: Sandy seashores, southern British Columbia to Santa Barbara County, California.

ILLUSTRATIONS: Bot. Mag. *pl.* 6546; Cycl. Am. Hort. 1: *f.* 3; Gard. Chron. II. 16: 365; Hook. Exot. Fl. *pl.* 193; Contr. U. S. Nat. Herb. 12: *f.* 49.

II. *Maritimae*. Prostrate perennials of seashores. Leaf-blades mostly oval. Bracts lanceolate or linear-lanceolate. Perianth deep dark-red. Fruit thick-coriaceous, deeply lobed, the lobes winglike.

## 2. *Abronia maritima* Nutt.; S. Wats. Bot. Calif. 2: 4. 1880.

Perennial, much branched, the branches very stout, 2–10 dm. long, densely glandular-puberulent and often short-villous, the internodes longer or shorter than the leaves; petioles stout, 1–2.5 cm. long; leaf-blades broadly oval, ovate-oval, or oval-oblong, rarely suborbicular, 2–5.5 cm. long, 1–4 cm. wide, rounded to cuneate at the base, broadly rounded at the apex, entire, very thick and succulent, concolorous, minutely and very densely viscid-puberulent; peduncles axillary, numerous, 1.5–8 cm. long; heads few- or many-flowered, the bracts lanceolate or linear-lanceolate, attenuate or long-attenuate, 8–11 mm. long, densely viscid-villous; perianth 12–14 mm. long, deep dark-red, densely glandular-puberulent and more or less villous, the limb about 4 mm. broad; fruit 10–15 mm. long, coriaceous, turbinate but often very irregular, frequently broader than long, deeply lobed, the lobes very thin and acute, usually extended above the body of the fruit, densely puberulent or short-villous, glabrate below; seed oblong, 5 mm. long, dark blackish-brown, lustrous.

TYPE LOCALITY: San Pedro, California.

DISTRIBUTION: On sea beaches, Santa Barbara County, California, to Lower California and Sinaloa.

III. *Umbellatae*. Annuals or perennials, erect, decumbent, or prostrate, of seashores or of interior valleys and hillsides. Leaf-blades variable in outline. Bracts usually small and narrow. Perianth purplish-red, pink, or white. Fruits, at least most of those in each head, winged, the outermost ones often exalate (all exalate in one species), the body usually indurate and woody.

## 3. *Abronia alpina* Brand. Bot. Gaz. 27: 456. 1899.

Annual, much branched, the branches prostrate, forming mats 2 dm. or less in diameter, viscid-puberulent or short-villous; petioles slender, 1–2 cm. long, short-villous; leaf-blades orbicular or rounded-oval, 4–9 mm. long and of about the same breadth, entire, viscid-puberulent; peduncles slender, 5–6 mm. long, viscid-puberulent; bracts lance-ovate, 2–3 mm. long, attenuate; heads 3–5-flowered; perianth 12–15 mm. long, white or pink, viscidly short-villous outside, the limb 8 mm. wide or less; fruit 3–4 mm. long, narrowed to each end, obtusely or acutely angled, reticulate-veined, puberulent.

TYPE LOCALITY: Monatchy Meadows of Mount Whitney, California, at an elevation of 2100 to 2400 meters.

DISTRIBUTION: Sandy meadows in the southern Sierra Nevada, California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *f.* 58.

## 4. *Abronia pogonantha* Heimerl, Bot. Jahrb. 11: 87. 1889.

*Abronia angulata* M. E. Jones, Contr. West. Bot. 8: 39. 1898.

Annual, much branched, the branches stout, ascending or decumbent, villous with long slender hairs and viscid-puberulent, often tinged with red; petioles 1–3.5 cm. long; leaf-blades ovate-oblong or broadly ovate, rarely orbicular-ovate or ovate-deltoid, 2.5–4.5 cm. long, 1–2 or rarely 3 cm. wide, rounded or rarely cordate at the base, rounded or very obtuse at the apex, entire, glandular-puberulent or glabrate on the upper surface, viscid-villous along the veins beneath and on the margins, at least when young; peduncles slender, 2–7 cm. long, viscid-villous and glandular-puberulent; bracts broadly ovate or rounded-ovate, 7–10 mm.



long, acute or attenuate, scarious, viscid-villous outside, perianth about 2 cm. long, white or pink, the tube puberulent or glabrate above, usually densely long-villous below, the limb 6–8 mm. broad; fruit orbicular-obcordate, 3–6 mm. long, compressed, 2-winged, rounded or obtuse at the base, the body finely reticulate-veined, the wings thin, obscurely veined, minutely ciliate; seed obovate, 2 mm. long, compressed, dark-brown, lustrous.

TYPE LOCALITY: Sandy banks of the Mohave River, California.

DISTRIBUTION: In sandy soil, Inyo County to Los Angeles County, California.

ILLUSTRATIONS: Bot. Jahrb. 11: *pl.* 2; Contr. U. S. Nat. Herb. 12: *f.* 57.

### 5. *Abronia pinetorum* Abrams, Bull. Torrey Club 32: 537. 1905.

*Abronia aurita* Abrams, Bull. Torrey Club 32: 537. 1905.

*Abronia villosa aurita* Jepson, Fl. Calif. 455. 1914.

Annual, much branched, the branches ascending, decumbent, or procumbent, 2–8 dm. long, stout, viscid-villous with long slender hairs; petioles slender, 1–5 cm. long, villous; leaf-blades rhombic-orbicular to oval or deltoid-ovate, 1.5–8 cm. long, 1–6.5 cm. wide, subcordate to obtuse at the base, sometimes short-decurrent, broadly rounded to obtuse at the apex, entire or undulate, viscid-villous on both surfaces or sometimes glabrate above; peduncles stout or slender, 3–12.5 cm. long, villous; bracts linear-lanceolate to ovate-lanceolate, 8–12 mm. long, attenuate or long-attenuate, viscid-villous outside; perianth 2.5–3.5 cm. long, purplish-red, the tube puberulent, short-villous, or glabrate above, long-villous below, the limb 1.5–2 cm. wide; fruit 7–15 mm. long and usually broader, the body indurate, rugose-veined, the 3 or 4 wings thin, broad, usually extended above the body, rounded, acutish, or truncate at the apex, smooth or obscurely rugose-veined, stramineous or whitish, usually villous-ciliate; seed oblong, 2–4 mm. long, brown, lustrous.

TYPE LOCALITY: Open pine forests, Thomas Valley, San Jacinto Mountains California.

DISTRIBUTION: Riverside and San Diego counties, California.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *f.* 55, 56.

### 6. *Abronia villosa* S. Wats. Am. Nat. 7: 302. 1873.

Annual, much branched, the branches stout, 1–5 dm. long, ascending, decumbent, or procumbent, villous and usually very viscid, often tinged with red; petioles slender or stout, 0.5–3.5 cm. long; leaf-blades rhombic-ovate to oval, oblong, deltoid-ovate, or suborbicular, 1–3.5 cm. long, 1–2.5 cm. wide, rounded or subcordate at the base and often very unequal, sometimes short-decurrent, broadly rounded to acutish at the apex, entire or sometimes undulate, viscid-puberulent or glabrate on the upper surface, usually viscid-villous beneath; peduncles slender, 2–8.5 cm. long, densely or sparsely viscid-villous; bracts linear-lanceolate to ovate-lanceolate, 6–9 mm. long, attenuate or long-attenuate, scarious, viscid-villous outside; perianth 17–20 mm. long, purplish-red, the tube densely villous throughout with short or long hairs, rarely only puberulent above, the limb about 1 cm. broad; fruit 6–8 mm. long and often broader than long, the body indurate, rugose-veined, villous above, the wings 3 or 4, or sometimes abortive, broad, thin, usually prolonged above the body, rounded to acutish above, whitish, stramineous, or tinged with red, ciliate above; seed narrowly oblong, 2.5 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Arizona.

DISTRIBUTION: In sandy soil, southwestern Arizona, western Sonora, and southern California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *f.* 54.

### 7. *Abronia acutalata* Standley, Contr. U. S. Nat. Herb. 12: 312. 1909.

Annual, much branched, the branches prostrate, stout, short-villous with viscid whitish hairs; petioles stout, 1–4.5 cm. long; leaf-blades ovate to ovate-oval or oval, 2–5 cm. long, 0.8–3 cm. wide, rounded to acute at the base and often very unequal, rounded or very obtuse at the apex, entire, green, minutely viscid-puberulent or glabrous; peduncles slender, 2.5–4.5 cm. long, villous with short viscid hairs; bracts lanceolate, very acute, 5 mm. long, viscid-villous; perianth 12 mm. long, the tube villous with short viscid hairs, green, the limb



5 mm. wide, purplish-red; fruit about 1 cm. long and wide, the body short-villous above, the wings thin, prolonged above the body and acute, narrowed below.

TYPE LOCALITY: Clallam County, Washington.

DISTRIBUTION: On sandy beaches, Clallam County, Washington.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 29, *f.* 1.

8. *Abronia breviflora* Standley, Contr. U. S. Nat. Herb. 12: 312.  
1909.

Annual, much branched, the branches slender or stout, prostrate, densely viscid-puberulent and more or less short-villous; petioles slender, 1.5–4 cm. long; leaf-blades broadly ovate to ovate-oblong, 2–3.5 cm. long, 1–2 cm. wide, rounded or obtuse at the base, rounded to obtuse at the apex, entire, green, sparsely and minutely viscid-puberulent; peduncles slender, 2–4 cm. long, viscid-puberulent or short-villous; bracts linear-lanceolate or lanceolate, 5–6 mm. long, attenuate or long-attenuate, short-villous outside, scarious; perianth 12 mm. long, the tube green, short-villous with white hairs, the limb 5 mm. broad, purplish-red; fruit about 8 mm. long, the body tapering to each end, indurate, short-villous above, nearly smooth, the wings thin, whitish or stramineous, narrow, narrowed at both ends, the wings sometimes abortive; seed narrowly oblong, 2.5–3 cm. wide, dark-brown, lustrous.

TYPE LOCALITY: Mendocino, California.

DISTRIBUTION: On sandy beaches, Humboldt and Mendocino counties, California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 30.

9. *Abronia alba* Eastw. Proc. Calif. Acad. III. 1: 97. 1898.

*Abronia umbellata alba* M. E. Jones, Contr. West. Bot. 10: 45. 1902.

*Abronia insularis* Standley, Contr. U. S. Nat. Herb. 12: 311. 1909.

*Abronia neurophylla* Standley, Contr. U. S. Nat. Herb. 12: 314. 1909.

Perennial, from an elongate woody root; stems stout or slender, 2–10 dm. long, sparsely branched, stramineous or whitish, often tinged with red, viscid-puberulent or glabrate, the internodes usually longer than the leaves; petioles slender, 1–3.5 cm. long, viscid-puberulent or glabrate; leaf-blades irregular in outline, suborbicular, rounded-rhombic, oval, ovate-oval, deltoid-ovate, or elliptic-oblong, 1–4.5 cm. long, 1–3.5 cm. wide, truncate to obtuse at the base, rounded or very obtuse at the apex, entire or subsinuate, succulent, glabrous or sparsely viscid-puberulent; peduncles slender, 4–12 cm. long, viscid-puberulent or glabrate; bracts lanceolate, 5–7 mm. long, acute or attenuate, scarious, viscid-puberulent; flowers numerous, the perianth 15–20 mm. long, the tube slender, greenish-pink, viscid-puberulent, the limb 7–10 mm. broad, rose-purple or white; fruit about 1 cm. long, puberulent or short-villous above, the body indurate, 1-costate in the angles, 5-winged, the wings coriaceous, conspicuously veined, prolonged above the body and rounded, narrowed below; seed elliptic-oblong, 4–5 mm. long, brown.

TYPE LOCALITY: San Nicolas Island, California.

DISTRIBUTION: Sandy seashores, San Nicolas and San Clemente islands, and on the adjacent coast of California.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *f.* 51, *pl.* 28, 32; Proc. Calif. Acad. III. 1: *pl.* 8, *f.* 4a, 4b.

10. *Abronia umbellata* Lam. Tab. Encyc. 1: 469. 1791.

*Tricratus admirabilis* L'Hér.; Willd. Sp. Pl. 1: 807. 1797.

*Abronia californica* Raeusch. Nom. Bot. ed. 3. 191. 1797.

*Abronia rotundifolia* Gaertn. Fruct. 3: 181. 1807.

*Abronia glauca* Menzies; Hook. Exot. Fl. *pl.* 194, as synonym. 1827.

*Abronia rosea* Hartw.; Baxter, in Loud. Hort. Brit. Suppl. 479, hyponym. 1850.

Perennial; stems slender, prostrate, 2–10 dm. long, sparsely or much branched, succulent, often tinged with red, viscid-puberulent or glabrous, the internodes usually longer than the leaves; petioles slender, 1–5 cm. long, viscid-puberulent or glabrous; leaf-blades irregular in outline, oval-ovate, rhombic-oval, oval, ovate, lance-elliptic, or lance-oblong, 1.5–7 cm. long, 0.5–3.5 cm. wide, rounded to very acute at the base, rounded or obtuse at the apex, entire or subsinuate, succulent, sparsely viscid-puberulent or glabrous; peduncles slender, 3–15 mm. long, viscid-puberulent or glabrate; bracts lanceolate or linear-lanceolate, 5–7 mm. long,



acute to attenuate, scarious, viscid-puberulent; flowers numerous, the perianth 12–16 mm. long, the tube yellowish-green, viscid-puberulent, the limb 8–10 mm. broad, rose-purple; fruit about 1 cm. long and wide, viscid-villous or puberulent above, the body indurate, 1–3-costate in the angles, usually 5-winged, the wings coriaceous, truncate or narrowed upward, not prolonged above the body, slightly narrowed toward the base; seed elliptic-oblong, 3–5 mm. long, brown.

TYPE LOCALITY: Described from specimens cultivated at Paris, grown from seeds brought from Monterey, California.

DISTRIBUTION: Sandy seashores, California, from Marin County to Los Angeles County.

ILLUSTRATIONS: Fl. Serres 11: *pl.* 1095; Hook. Exot. Fl. *pl.* 194; Paxton's Mag. Bot. 16: *pl.* 36; Nicholson, Dict. Gard. 1: *f.* 1; Gaertn. Fruct. *pl.* 214; Cav. Ic. *pl.* 326; Kerner, Hort. Semperv. *pl.* 725; Jour. Hort. Soc. London 4: 82; Contr. U. S. Nat. Herb. 12: *f.* 52; Lam. Tab. Encyc. 1: *pl.* 105.

Specimens collected on the shores of Monterey Bay, Monterey, California (Pl. Calif. Distr. Univ. Calif. no. 88) are believed by Mrs. K. Brandegee to represent a hybrid between *Abronia latifolia* and *A. umbellata*. In habit the plants are said to resemble *A. latifolia*; the perianth is either pink or yellow. Aside from the color of the flowers, the specimens seem to agree very well with typical *A. umbellata*.

### 11. *Abronia gracilis* Benth. Bot. Voy. Sulph. 44. 1844.

*Abronia platyphylla* Standley, Contr. U. S. Nat. Herb. 12: 314. 1909.

*Abronia alba platyphylla* Jepson, Fl. Calif. 455. 1914.

Annual, much branched, the branches slender, 1–6 dm. long, prostrate, viscid-villous or rarely only viscid-puberulent; petioles slender, 1–3 cm. long; leaf-blades oblong to oval, ovate, or suborbicular, 2–4.5 cm. long, 0.7–3 cm. wide, rounded or obtuse at the base, broadly rounded to obtuse at the apex, green, undulate or often deeply sinuate-lobed, viscid-puberulent or villous, often glabrate on the upper surface; peduncles slender, 2–10 cm. long, copiously viscid-villous or rarely glabrate; bracts ovate, ovate-oblong, or broadly ovate, 6–10 mm. long, attenuate or long-attenuate, villous outside, scarious; perianth about 2 cm. long, purplish-red or pink, the tube viscid-puberulent or villous, the limb 7–8 mm. wide; fruit 6–11 mm. long, stramineous or whitish, the body indurate, rugose-veined or nearly smooth, villous above, the wings 3–5, broad, thin, smooth or obscurely veined, prolonged above the body and rounded, with usually narrow sinuses, only slightly narrowed below, villous-ciliate above; seed oblong, 2.5–3 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Magdalena Bay, Lower California.

DISTRIBUTION: On sandy beaches, Lower California and San Diego County, California.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *f.* 53, *pl.* 33.

### 12. *Abronia minor* Standley, Contr. U. S. Nat. Herb. 12: 313. 1909.

*Abronia variabilis* Standley, Contr. U. S. Nat. Herb. 12: 314. 1909.

*Abronia alba variabilis* Jepson, Fl. Calif. 455. 1914.

Annual, much branched, the branches slender, prostrate, 2–10 dm. long, minutely puberulent and slightly viscid or often glabrate, the internodes usually much longer than the leaves; petioles slender, 1–5 cm. long; leaf-blades very irregular in outline, oval, broadly ovate, suborbicular, obovate, narrowly elliptic, or lanceolate, 2–4 cm. long, 0.3–2.5 cm. wide, rounded to attenuate at the base, broadly rounded to obtuse at the apex, entire or undulate or rarely sinuate-lobed, glabrous or minutely viscid-puberulent; peduncles slender, 2–7 cm. long, viscid-puberulent or rarely short-villous; bracts lanceolate or linear-lanceolate, 5–8 mm. long, very acute or attenuate, scarious, viscid-puberulent or short-villous outside; perianth 17–20 mm. long, purplish-red, the tube viscid-puberulent or short-villous, the limb 7–10 mm. broad; fruit 6–12 mm. long, usually broader than long, the body indurate, rugose-veined or nearly smooth, puberulent above, the wings thin, broad, prolonged above the body and rounded or acutish, ciliolate above, the outer fruits of the head often exalate; seed narrowly oblong, 2.5–3.5 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Near San Luis Obispo, California.

DISTRIBUTION: On sandy beaches, San Luis Obispo County to San Diego County, California.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *pl.* 29, *f.* 2, *pl.* 31, *f.* 1.



13. *Abronia mellifera* Dougl. Bot. Mag. 56: *pl.* 2879. 1829.*Abronia Menziesii* Dougl.; Hook. Fl. Bor. Am. 2: 125, as synonym. 1838.*Abronia vespertina* Dougl.; Hook. Fl. Bor. Am. 2: 125, as synonym. 1838.*Abronia Suksdorfii* Coult. & Fisher, Bot. Gaz. 17: 348. 1892.*Abronia lanceolata* Rydb. Bull. Torrey Club 29: 685. 1902.

Perennial; stems few or numerous, stout or slender, erect or decumbent, 2–6 dm. long, copiously or sparsely branched, whitish, minutely viscid-puberulent or glabrate, the internodes short or elongate; petioles slender, 1–5 cm. long, puberulent or glabrate; leaf-blades mostly ovate-oblong, sometimes suborbicular, rhombic-ovate, oval, or lance-elliptic, 1.5–6 cm. long, 1–4 cm. wide, rounded to acute at the base, rounded to acute at the apex, entire or subsinuate, minutely puberulent or glabrate; peduncles slender, 4–20 cm. long, minutely viscid-puberulent or glabrate; bracts linear-lanceolate to lance-oblong, 5–10 mm. long, 2–3 mm. wide, or rarely wider in age, acute to attenuate, scarious, white, minutely viscid-puberulent or glabrate; flowers numerous, the perianth 22–30 mm. long, obscurely puberulent or glabrous, the tube very slender, greenish-white, the limb 8–11 mm. broad, white; fruit 7–10 mm. long and of about the same breadth, subcoriaceous or thick-coriaceous, minutely puberulent, usually stramineous, commonly 5-winged, the wings thin, narrowed below, truncate above, or sometimes slightly prolonged above the body and rounded; seed elliptic-oblong, 2.5–3 mm. long, dark-brown.

TYPE LOCALITY: Near the Great [Celilo] Falls of the Columbia River, Oregon or Washington.

DISTRIBUTION: In sand or sandy soil, Idaho and eastern Washington and Oregon.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *f.* 66, 67.

IV. *Nanae*. Cespitose perennials with branched caudices, appearing acaulescent. Leaves crowded, apparently basal, the blades narrow or broad. Peduncles scapelike. Bracts small and narrow or large and broad. Perianth white (unknown in one species). Fruit deeply lobed, the lobes winglike.

14. *Abronia Covillei* Heimerl, Smithson. Misc. Coll. 52: 197. 1908.*Abronia nana* Coville, Contr. U. S. Nat. Herb. 4: 178. 1893. Not *A. nana* S. Wats. 1870.

Densely cespitose perennial from a thick woody root, the caudex much branched, the very stout branches interlaced, 3–4 cm. long, bearing dense fascicles of leaves; petioles 1–4 cm. long, puberulent; leaf-blades ovate-rhombic, ovate, ovate-oblong, oval, or suborbicular, 7–16 mm. long, 5–11 mm. wide, acute to truncate at the base, rounded or very obtuse at the apex, thick, entire, concolorous, minutely puberulent; peduncles scapelike, 1.7–10 cm. long, slender, minutely hirtellous or puberulent; heads 6-many-flowered, the 4–6 bracts lanceolate or narrowly oblong, 6–8 mm. long, 2 mm. wide, acute or attenuate, scarious, densely and finely puberulent; perianth 11 mm. long, finely puberulent, the limb about 8 mm. wide, white; stamens 5–7; fruit turbinate, 7–8 mm. long, thin, deeply lobed, puberulent above, glabrous below.

TYPE LOCALITY: Inyo Mountains, Inyo County, California.

DISTRIBUTION: Inyo and San Bernardino counties, California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 34.15. *Abronia nana* S. Wats. Proc. Am. Acad. 14: 294. 1870.*Abronia nana lanciformis* M. E. Jones, Contr. West. Bot. 11: 2. 1903.

Cespitose perennial from a thick woody root, the caudex sparsely branched, the branches stout, usually covered by the persistent imbricate petioles; leaves fasciculate, the slender petioles 1–5.5 cm. long, the blades oval, suborbicular, ovate, or oblong-elliptic, 1–2.5 cm. long, 0.5–1.4 cm. wide, acute to rounded at the base, rounded to acutish at the apex, thick, entire, concolorous, finely short-villous or minutely hirtellous when young, usually glabrate in age; peduncles scapelike, slender, 7–15 cm. long, viscid-villous; heads many-flowered, the bracts broadly oval, oval-ovate, or oblong, 8–10 mm. long, 4–6 mm. wide, obtuse and apiculate to acutish at the apex, scarious, glandular-puberulent and short-villous; perianth white, 2–2.5 cm. long, the slender tube glandular-puberulent or short-villous, the limb 7–8 mm. broad;



fruit turbinate, 7 mm. long, thin-walled, deeply lobed, truncate at the summit and puberulent, glabrous below.

TYPE LOCALITY: Near Beaver City, southern Utah, in dry ravines among junipers.

DISTRIBUTION: Southwestern Utah, northwestern Arizona, and eastern Nevada.

16. *Abronia Bigelovii* Heimerl, *Smithson. Misc. Coll.* 53: 197. 1908.

Cespitose perennial from a thick woody branched caudex; leaves all basal, densely fasciculate upon the caudices, the blades linear-oblong, linear, or linear-oblongate, about 3.5 cm. long, 3.5–4 mm. wide, obtuse at the apex, entire, green on both sides, glabrous, or minutely puberulent when young, gradually narrowed into a petiole equaling or longer than the blade; peduncles scapelike, 5–7 cm. long, slender, puberulent; heads many-flowered, the bracts oval or broadly oval-ovate, 8–10 mm. long, 3.5–7 mm. wide, abruptly acute or short-acuminate, scarious, minutely puberulent; perianth densely puberulent; anthocarp 6–7 mm. long, obpyramidal, lobed, thin, truncate above and pointed, densely puberulent.

TYPE LOCALITY: Near Galisteo, New Mexico.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: *Contr. U. S. Nat. Herb.* 12: *pl.* 35.

V. *Fragrantes*. Perennials with branched, erect or procumbent stems. Leaf-blades variable in outline, often very unequal at the base. Bracts usually large, broad, and conspicuous. Perianth white, or very rarely purplish-red. Fruits usually deeply lobed, the lobes mostly compressed and winglike, or the outer fruits of each head often elobate.

17. *Abronia salsa* Rydb. *Bull. Torrey Club* 29: 684. 1902.

*Abronia fallax* Heimerl; Rydb. *Bull. Torrey Club* 29: 684. 1902.

*Abronia fragrans pterocarpa* M. E. Jones, *Contr. West. Bot.* 11: 3. 1903.

Perennial, from a somewhat woody elongate root; stems few or numerous, 2–5 dm. long, erect or decumbent, stout, whitish or stramineous, short-villous or puberulent below or sometimes glabrate, viscid-villous above with short hairs, the internodes elongate; petioles slender, 1–4 cm. long, viscid-puberulent or short-villous; leaf-blades oblong, oval, elliptic-oblong, or oblong-ovate, rarely deltoid-ovate or suborbicular, sometimes lanceolate, 2–5.5 cm. long, 0.7–3 cm. wide, rounded to acute at the base, broadly rounded to acute at the apex, entire or subsinuate, concolorous or paler beneath, densely viscid-puberulent; peduncles slender or stout, 1.5–8 cm. long, viscid-villous; bracts broadly oval or rounded-ovate, 10–16 mm. long, 5–12 mm. wide, acute, white, scarious, viscid-villous or puberulent; flowers numerous, the perianth 18–25 mm. long, the tube very slender, villous, greenish, the limb 5–8 mm. broad, white; fruit turbinate, 5–7 mm. long, coriaceous, whitish-stramineous, short-villous or puberulent, usually deeply 5-lobed, the lobes compressed and winglike, finely reticulate-veined, truncate at the summit and flattened; seed narrowly obovoid, 2.5–3 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Salt Lake City, Utah.

DISTRIBUTION: In sandy soil, Utah.

ILLUSTRATIONS: *Contr. U. S. Nat. Herb.* 12: *f.* 61, 62.

18. *Abronia fragrans* Nutt.; Hook. *Jour. Bot. & Kew Misc.* 5: 261. 1853.

*Abronia speciosa* Buckl. *Proc. Acad. Phila.* 1862: 7. 1862.

*Abronia nudata* Rydb. *Bull. Torrey Club* 29: 683. 1902.

*Abronia robusta* Standley, *Contr. U. S. Nat. Herb.* 12: 324. 1909.

*Abronia Fendleri* Standley, *Contr. U. S. Nat. Herb.* 12: 324. 1909.

Perennial, from a thick elongate woody root; stems few or numerous, 2–10 dm. long, erect or procumbent, stout, usually much branched, whitish or greenish-stramineous, viscid-puberulent or villous below, or rarely glabrate, densely viscid-villous above with short or long hairs, the internodes short or elongate; petioles slender or stout, 1–5.5 cm. long, viscid-villous; leaf-blades variable in outline, mostly ovate-oblong or narrowly deltoid-ovate, sometimes oblong, deltoid, elliptic, oval, or lanceolate, 2.5–9 cm. long, 0.8–5.5 cm. wide, truncate to



obtuse at the base or rarely subcordate, rounded to acute at the apex, entire or subsinuate, concolorous or paler beneath, densely viscid-puberulent or short-villous or rarely glabrate; peduncles slender or stout, 3–12 cm. long, viscid-villous; bracts oval, ovate-oval, or ovate, 10–18 mm. long, 4–12 mm. wide, acute or attenuate, scarious, whitish, viscid-villous or puberulent; flowers numerous, the perianth 20–25 mm. long, viscid-puberulent or short-villous, the tube very slender, greenish, the limb 7–10 mm. broad, white or very rarely purplish-red; fruit usually biturbinate, 5–10 mm. long, coriaceous, short-villous or puberulent, the inner ones of each head deeply 5-lobed, the lobes compressed and winglike, even at the summit, narrowed or truncate above, coarsely reticulate-veined, the outer fruits often fusiform and elobate; seed obovate, 2.5–3 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Sandhills of the Platte River [Colorado?].

DISTRIBUTION: Usually in sandy soil, South Dakota to Idaho, southeastern Utah, Chihuahua, and western Texas.

ILLUSTRATIONS: Pacif. R. R. Rep. 2: *pl.* 10; Bot. Mag. *pl.* 5544; Contr. U. S. Nat. Herb. 12: *f.* 63, 64, *pl.* 42, 43; Britt. & Brown, Ill. Fl. *f.* 1422; ed. 2. *f.* 1731; Clements, Rocky Mt. Fl. *pl.* 9, *f.* 15.

*Abronia speciosa* Buckl. was based upon the red-flowered plant, which is known only from a few collections from Oklahoma and Texas. It appears to be merely a color variant of *A. fragrans*.

### 19. *Abronia elliptica* A. Nelson, Bull. Torrey Club 26: 7. 1899.

*Abronia Bakeri* Greene, Pl. Baker. 3: 32. 1901.

*Abronia fragrans elliptica* Heimerl; Rydb. Bull. Torrey Club 29: 684. 1902.

*Abronia glabra* Rydb. Bull. Torrey Club 29: 685. 1902.

*Abronia fragrans elliptica* M. E. Jones, Contr. West. Bot. 11: 3. 1903.

*Abronia ramosa* Standley, Contr. U. S. Nat. Herb. 12: 321. 1909.

*Abronia glabrifolia* Standley, Contr. U. S. Nat. Herb. 12: 321. 1909.

Perennial, often from a woody root; stems usually numerous, erect or decumbent, 1–5 dm. long, stout, usually copiously branched, whitish or tinged with red, glabrous or finely viscid-puberulent, especially above; petioles slender, 1–4 cm. long, puberulent or glabrate; leaf-blades usually oval, oval-oblong, or ovate-oblong, sometimes deltoid or elliptic-ovate, or those of the lowest leaves suborbicular, 1–5.5 cm. long, 0.8–3.5 cm. wide, rounded, truncate, or obtuse at the base, rounded or obtuse at the apex, succulent, entire or subsinuate, usually pale or glaucescent beneath, minutely puberulent or glabrous; peduncles slender, 2–12 cm. long, glabrous or puberulent; bracts broadly oval or obovate-oval, 10–12 mm. long, 5–7 mm. wide, rounded and often apiculate at the apex, scarious, white or greenish-white, glabrous or minutely puberulent; flowers very numerous, the perianth 18–22 mm. long, viscid-puberulent, the tube very slender, greenish-white or pinkish, the limb 5–8 mm. broad, white; fruit turbinate, or the outer ones biturbinate, 5–8 mm. long, subcoriaceous, puberulent or short-villous above, stramineous or olivaceous, usually deeply 5-lobed, the lobes compressed, finely reticulate-veined, rounded or truncate above and flattened at the apex; seed elliptic-oblong, 2.5–3 mm. long, brown, lustrous.

TYPE LOCALITY: Green River, Wyoming.

DISTRIBUTION: In dry, clay or sandy soil, Wyoming to northeastern Arizona and northwestern New Mexico.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *f.* 59, 60, *pl.* 39, 40, *f.* 1.

### 20. *Abronia orbiculata* Standley, Contr. U. S. Nat. Herb. 12: 322. 1909.

Perennial; stems numerous, ascending, 1.5–3 dm. long, stout, much branched, whitish, finely viscid-puberulent; petioles slender, 1–2.5 cm. long, viscid-puberulent; leaf-blades orbicular, rounded-oval, or rounded-deltoid, 0.8–1.7 cm. long, 0.6–1.4 cm. wide, rounded or truncate at the base, broadly rounded at the apex, entire, thick and succulent, concolorous or slightly paler beneath, densely and minutely viscid-puberulent, or glabrate in age; peduncles slender, 3–5 cm. long, viscid-puberulent; bracts broadly oval, 1 cm. long, 5–7 mm. wide, rounded at the apex, scarious, whitish, minutely viscid-puberulent; flowers numerous, the perianth 12–14 mm. long, viscid-puberulent, the tube slender, the limb about 5 mm. broad, white; fruit turbinate, 5 mm. long, whitish-puberulent, greenish-stramineous, usually deeply 5-lobed, the lobes compressed, truncate or rounded at the apex.

TYPE LOCALITY: Cottonwood Springs, Vegas Valley, Nevada, at an altitude of 1050 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 40, *f.* 2.



21. *Abronia glaucescens* (A. Nelson) Standley, Contr. U. S. Nat. Herb. 12: 326. 1909.

*Abronia fragrans glaucescens* A. Nelson, Bot. Gaz. 34: 364. 1902.

Perennial; stems ascending or procumbent, 3–10 dm. long, stout, glaucescent or greenish, often tinged with red, glabrous, or sparsely puberulent above, the internodes elongate; petioles slender or stout, 1–3.5 cm. long, glabrous or obscurely puberulent; leaf-blades rounded-deltoid, ovate-deltoid, ovate-oblong, or lance-oblong, 3–8 cm. long, 1–4.5 cm. wide, subcordate to obtuse at the base, broadly rounded to acute at the apex, glabrous or sparsely and minutely puberulent, glaucescent beneath; peduncles slender, 4–18 cm. long, glabrous or puberulent; bracts broadly oval or ovate-oval, 11–15 mm. long, 6–9 mm. wide, acute, scarious, white, glabrous or nearly so; flowers very numerous, the perianth 2–3 mm. long, viscid-puberulent, the tube slender, greenish, the limb 7–8 mm. broad, white; fruit biturbinate, 7–10 mm. long, 3–5 mm. thick, coriaceous, olivaceous-stramineous, sparsely puberulent, shallowly lobed or smooth, the lobes compressed, coarsely reticulate-veined, truncate or usually narrowed above; seed obovoid, 2.5–3 mm. long, castaneous, lustrous.

TYPE LOCALITY: Wyoming.

DISTRIBUTION: Wyoming and Colorado.

22. *Abronia ammophila* Greene, Pittonia 4: 226. 1900.

*Abronia arenaria* Rydb. Mem. N. Y. Bot. Gard. 1: 137. 1900. Not *A. arenaria* Menzies. 1827.

*Abronia Nelsoni* Heimerl, Ann. Cons. Jard. Genève 5: 191. 1901.

*Abronia cheradophila* A. Nelson, Bot. Gaz. 34: 364. 1902.

Perennial; stems stout, succulent, prostrate, 2–4 dm. long, densely viscid-puberulent, much branched, the internodes short; petioles slender, 2–4.5 cm. long, viscid-puberulent; leaf-blades oval, elliptic-oblong, or rhombic-ovate, 1–2.5 cm. long, 0.6–1.3 cm. wide, rounded to very acute at the base and usually very asymmetric, rounded at the apex, entire, succulent, minutely viscid-puberulent; peduncles slender, 3–5 cm. long, viscid-puberulent; bracts elliptic-oblong or lance-ovate, 4–5 mm. long, acute, viscid-puberulent; flowers numerous, the perianth about 12 mm. long, viscid-puberulent outside, the limb 5 mm. broad, greenish-white; fruit biturbinate, 4–6 mm. long, viscid-puberulent, coriaceous, deeply 5-lobed, the lobes acute and winglike, obscurely veined, tapering to each end; seed obovoid, 2.5–3 mm. long, brown.

TYPE LOCALITY: Mouth of Pelican Creek, Yellowstone National Park, Wyoming.

DISTRIBUTION: Sandy shores, vicinity of the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: f. 65.

23. *Abronia texana* Standley, Contr. U. S. Nat. Herb. 12: 323. 1909.

Perennial; stems stout, 2–6 dm. long; ascending or procumbent, sparsely branched, sparsely short-villous or glabrate, the internodes short or elongate; petioles slender, 1–4 cm. long, finely puberulent or glabrate; leaf-blades ovate-deltoid, rhombic-ovate, or deltoid, 2–6.5 cm. long, 1.2–4 cm. wide, cordate to rounded at the base, rounded or very obtuse at the apex, entire or subsinuate, sparsely puberulent or glabrate; peduncles slender, 4–12 cm. long, viscid-puberulent; bracts linear-lanceolate to narrowly oval, 7–10 mm. long, usually 2–3 mm., rarely 4 mm., wide, acute to attenuate, scarious, whitish, short-villous or puberulent; flowers numerous, the perianth 15–20 mm. long, the tube very slender, viscid-puberulent, greenish, the limb 6–8 mm. broad, white; fruit biturbinate, 6–8 mm. long, 3–4 mm. broad, thin, puberulent, brownish-gray, deeply 5-lobed, or the outer fruits obscurely lobed, the lobes usually compressed and winglike, narrowed toward each end; seed elliptic-oblong, 2.5 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Estelline, Texas.

DISTRIBUTION: In sandy soil, northern and western Texas.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: pl. 41, f. 2.

24. *Abronia pumila* Rydb. Bull. Torrey Club 29: 683. 1902.

*Abronia sparsifolia* Standley, Contr. U. S. Nat. Herb. 12: 322. 1909.

Perennial, from a slender woody root; stems few or numerous, ascending or decumbent, 1–4 dm. long, stout, whitish, minutely viscid-puberulent or glabrate, sparsely branched, the



internodes short or elongate; petioles slender, 1–3 cm. long, puberulent or glabrate; leaf-blades ovate-oblong, ovate-orbicular, deltoid-ovate, or elliptic-oblong, 1.5–3.5 cm. long, 0.7–2.5 cm. wide, subcordate to obtuse at the base, rounded or obtuse at the apex, entire, thick and succulent, often glaucescent beneath, minutely puberulent or glabrate; peduncles slender, 2–5 cm. long, viscid-puberulent; bracts broadly ovate or oval, 5–10 mm. long, 4–5 mm. wide, acute or attenuate, scarious, whitish, viscid-puberulent; flowers numerous, the perianth 13–18 mm. long, viscid-puberulent, the tube slender, the limb about 5 mm. broad; fruit turbinate, about 5 mm. long, subcoriaceous stramineous or olivaceous, finely puberulent, usually deeply 5-lobed, the lobes compressed, truncate and flat above; seed elliptic-oblong, 2.5 mm. long, brown.

TYPE LOCALITY: Emery, Utah, at an altitude of 2100 meters.

DISTRIBUTION: Southern Utah and adjacent Nevada and Arizona.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 31, *f.* 2.

## 25. *Abronia Carletoni* Coult. & Fisher, Bot. Gaz. 17: 349. 1892.

*Abronia turbinata Carletoni* M. E. Jones, Contr. West. Bot. 10: 44. 1902.

*Abronia Nealleyi* Standley, Contr. U. S. Nat. Herb. 12: 323. 1909.

Perennial; stems few or numerous, ascending or procumbent, 1.5–5 dm. long, stout or slender, whitish, viscid-puberulent, sparsely or copiously branched, the internodes elongate; petioles slender, 1–2 cm. long, puberulent; leaf-blades elliptic to lanceolate or ovate-oblong, 1.5–2.5 cm. long, 0.4–1 cm. wide, obtuse to very acute at the base, obtuse to attenuate at the apex, entire or subsinuate, thick and succulent, concolorous, puberulent or glabrate; peduncles slender, 2–5 cm. long, viscid-puberulent; bracts ovate or oval-ovate, 5–8 mm. long, 3–4 mm. wide, acute or attenuate, scarious, whitish, viscid-puberulent; flowers numerous, the perianth 13–15 mm. long, viscid-puberulent or short-villous, the tube slender, the limb 6–7 mm. broad, white; fruit biturbinate, 4–5 mm. long, subcoriaceous, brownish-olivaceous or stramineous, short-villous or puberulent, usually deeply 5-lobed, the lobes compressed, coarsely reticulate-veined, narrowed or subtruncate above and compressed at the apex; seed elliptic-oblong, 2 mm. long, nearly black, lustrous.

TYPE LOCALITY: Eastern Colorado.

DISTRIBUTION: Eastern Colorado to western Texas.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 41, *f.* 1.

VI. *Turbinatae*. Erect or prostrate annuals of interior valleys and hillsides, with elongate branched stems. Leaf-blades variable in outline, often very unequal at the base. Bracts usually small and narrow. Perianth purplish-red or often white inside and reddish outside. Fruit shallowly or deeply lobed, the lobes often much compressed.

## 26. *Abronia angustifolia* Greene, Pittonia 3: 344. 1898.

*Abronia mellifera* Torr. Bot. Mex. Bound. Surv. 170. 1859. Not *A. mellifera* Dougl. 1829.

*Abronia turbinata* Torr.; S. Wats. Bot. King's Expl. 285, in part. 1871.

*Abronia turbinata stenophylla* Heimerl, Ann. Cons. Jard. Genève 5: 190. 1901.

*Abronia arizonica* Standley, Contr. U. S. Nat. Herb. 12: 319. 1909.

*Abronia lobatifolia* Standley, Contr. U. S. Nat. Herb. 12: 319. 1909.

*Abronia Torreyi* Standley, Contr. U. S. Nat. Herb. 12: 319. 1909.

Annual, much branched, the branches stout or slender, ascending or decumbent, 1–5 dm. long, densely viscid-puberulent or short-villous; petioles slender, 1–7.5 cm. long; leaf-blades very variable in outline, mostly ovate-oblong or lance-oblong, sometimes broadly ovate-oval, oval, deltoid, lanceolate, or narrowly lance-oblong, 1.5–5 cm. long, 0.5–3 cm. wide, subcordate to narrowly cuneate at the base, obtuse to attenuate at the apex, entire or undulate, rarely shallowly lobed, viscid-puberulent or glabrate, often glaucescent beneath; peduncles 2–7 cm. long, viscid-puberulent or densely viscid-villous; bracts lanceolate or lance-linear, 6–12 mm. long, attenuate or long-attenuate, greenish, viscid-puberulent; perianth 15–20 mm. long, viscid-villous or puberulent outside, the limb 6–8 mm. wide, purplish-red; fruit about 6 mm. long, broadly turbinate, deeply lobed, thin-walled, villous above, the lobes acutish, ending above in flat disks; seed lance-oblong, 1.5–2 mm. long, deep-brown or black, lustrous.

TYPE LOCALITY: White Sands, Otero County, New Mexico.

DISTRIBUTION: In sandy soil, western Texas to southern Arizona, southward in Chihuahua.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 12: *pl.* 37, 38.



27. *Abronia turbinata* Torr.; S. Wats. Bot. King's Expl. 285. 1871.

*Abronia latiuscula* Greene, Leaflets 2: 105. 1910.

Annual, much branched, the branches erect, ascending, or decumbent, 1.5–5 dm. long, stout, viscid-puberulent when young, glabrate in age, often tinged with purplish-red; petioles slender, 1–4.5 cm. long; leaf-blades orbicular to ovate-orbicular or broadly oval, 1.4–3.7 cm. long, 1–3 cm. wide, broadly rounded or subcordate at the base and often unequal, broadly rounded at the apex or very obtuse, viscid-puberulent or glabrate, yellowish-green, entire, the blades of the uppermost leaves usually reduced and short-petiolate but not proportionally narrower than the lower ones; peduncles slender, 2.5–9.5 cm. long, viscid-puberulent; bracts lanceolate, lance-oblong, or linear-lanceolate, 5–7 mm. long, scarious, long-attenuate or very acute, viscid-puberulent; perianth 17–22 mm. long, viscid-villosulous or minutely viscid-puberulent outside, the limb 6 mm. broad, white, the tube pinkish; inner fruits of the head broadly turbinate, 5 mm. long and often broader, deeply lobed, the lobes compressed and winglike, acute, truncate above and short-villous; seed lance-oblong, 2 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Carson and Humboldt valleys, Nevada.

DISTRIBUTION: In sandy soil, southern Oregon, western Nevada, and eastern California.

ILLUSTRATIONS: S. Wats. Bot. King's Expl. *pl.* 31; Contr. U. S. Nat. Herb. 12: *pl.* 36, *f.* 2.

28. *Abronia exalata* Standley, Contr. U. S. Nat. Herb. 12: 318.  
1909.

*Abronia turbinata* Coville, Contr. U. S. Nat. Herb. 4: 178. 1893. Not *A. turbinata* Torr. 1871.

Annual, much branched, the branches stout, ascending or decumbent, 2–5 dm. long, densely viscid-puberulent or rarely glabrate, sometimes tinged with purplish-red; petioles slender, 1–3 cm. long; leaf-blades orbicular to ovate-orbicular or broadly oval, 1–3.5 cm. long, 1–3.5 cm. wide, subcordate or broadly rounded at the base and often very unequal, broadly rounded to very obtuse at the apex, entire, viscid-puberulent or glabrous, yellowish-green, often glaucescent beneath; peduncles 2–5 cm. long, viscid-puberulent; bracts ovate or oval, 5–7 mm. long, obtuse or acutish, scarious, viscid-puberulent; perianth 1.2–2 cm. long, viscid-puberulent or short-villous outside, the limb 5–6 mm. wide, white or nearly so, the tube pinkish; inner fruits of the head turbinate, 3 mm. long, shallowly lobed, the lobes broad, obtuse, truncate above, short-villous; seed lance-oblong, 1.5 mm. long, dark-brown, lustrous.

TYPE LOCALITY: Near Keeler, Inyo County, California, at an altitude of 1,100 meters.

DISTRIBUTION: In sandy soil, western Nevada and southeastern California.

ILLUSTRATION: Contr. U. S. Nat. Herb. 12: *pl.* 36, *f.* 1.



## COMPLETED VOLUME

9 : i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

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- 21<sup>1</sup>: 1-93. Chenopodiales: Chenopodiaceae.
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- 22<sup>1</sup>: 1-80. Rosales: Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae.
- 22<sup>2</sup>: 81-192. (Rosales:) Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Pterostemonaceae, Hamamelidaceae, Altingiaceae, Phyllonomaceae.
- 22<sup>3</sup>: 193-292. (Rosales:) Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars).
- 22<sup>4</sup>: 293-388. (Rosales:) Rosaceae (pars).
- 22<sup>5</sup>: 389-480. (Rosales:) Rosaceae (pars).
- 25<sup>1</sup>: 1-88. Geraniales: Geraniaceae, Oxalidaceae, Erythroxylaceae, Linaceae.
- 25<sup>2</sup>: 89-171. (Geraniales:) Tropaeolaceae, Balsaminaceae, Limnanthaceae, Koeberliniaceae, Zygophyllaceae, Malpighiaceae.
- 25<sup>3</sup>: 173-261. (Geraniales:) Rutaceae, Surianaceae, Simaroubaceae, Burseraceae.
- 29<sup>1</sup>: 1-102. Ericales: Clethraceae, Monotropaceae, Lennoaceae, Pyrolaceae, Ericaceae.
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- 34<sup>2</sup>: 81-180. (Carduales:) Carduaceae (pars).
- 34<sup>3</sup>: 181-288. (Carduales:) Carduaceae (pars).



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